CHIMANE RESOURCE USE AND MARKET INVOLVEMENT IN THE BENI BIOSPHERE RESERVE, BOLIVIA

By

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To the memory of Víctor Chicchón Jáuregui, my father.

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Abstract of Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

CHIMANE RESOURCE USE AND MARKET INVOLVEMENT IN THE BENI BIOSPHERE RESERVE, BOLIVIA

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Chairperson: Marianne Schmink
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This dissertation examines how the Chimane Indians of the Beni Biosphere Reserve use natural resources, especially by means of hunting and fishing. Chimane patterns of resource use are examined in light of their participation in the market economy which affects Chimane patterns of production and consumption.

Fieldwork was carried out from September 1988 to December 1989. A survey of all Chimane settlements in the Beni Biosphere Reserve was conducted during the first three months of research in order to identify general patterns of resource use. After the survey, three settlements within the Reserve were chosen for an in-depth comparative study.

The Chimane have traditionally occupied forested areas in the Bolivian Amazon. The Beni Biosphere Reserve lies in the northeasternmost part of the Chimane ethnic territory. The

Chimane who live in the Reserve use resources in the forest and in savanna areas as well. Chimane resource use patterns were found to respond to the availability of natural resources and to socio-economic constraints conditioned by the market economy. Many Chimane households opt to establish residences near market circuits when faunal resources become scarce. Many households intensify their agricultural activities in order to produce goods to sell or barter in the market. Furthermore, once game becomes scarce, there is a growing participation in fishing activities, especially during the dry season.

This research emphasizes the need to incorporate the local population into the management of the Reserve. Chimane cultural continuity and satisfactory quality of life will be secured only when they have the chance to have control over measures that directly affect their use of resources. Chimane responses to changes in their resource base for subsistence have a fundamental effect on the conservation of natural resources. A recent Bolivian decree has deeded part of the Reserve to the Chimane as their legitimate territory. The challenge to reconcile conservation with development efforts is under scrutiny. This research provides baseline information to address this challenge.

CHAPTER 1
INTRODUCTION

Statement of the Problem

The Beni Department of Bolivia is one of the few frontiers left in Amazonia (see fig. 1.1). The region is rich not only in biological diversity but in cultural diversity as well. The Chimane people are one indigenous group that, despite a long history of contact with segments of the national society, has remained remarkably distinct. This dissertation is about the Chimane, and especially those who live in the Beni Biosphere Reserve.

The Beni Biosphere Reserve (BBR) was created in October of 1986, but the area where it lies has been a center of attention for conservationists since the late 1970s. Spanish biologists working in that area contacted the Academia Nacional de Ciencias de Bolivia (ANCB) to officially establish a protected area at that site. In April 1982, the government created a commission to study the possibility of creating a protected area. The study was completed in October and the Estación Biológica del Beni (EBB) was officially created. All other parks and reserves in Bolivia are under the jurisdiction of the Ministerio de Agricultura y de Asuntos Campesinos (MACA), but in this case the EBB was to be managed under the

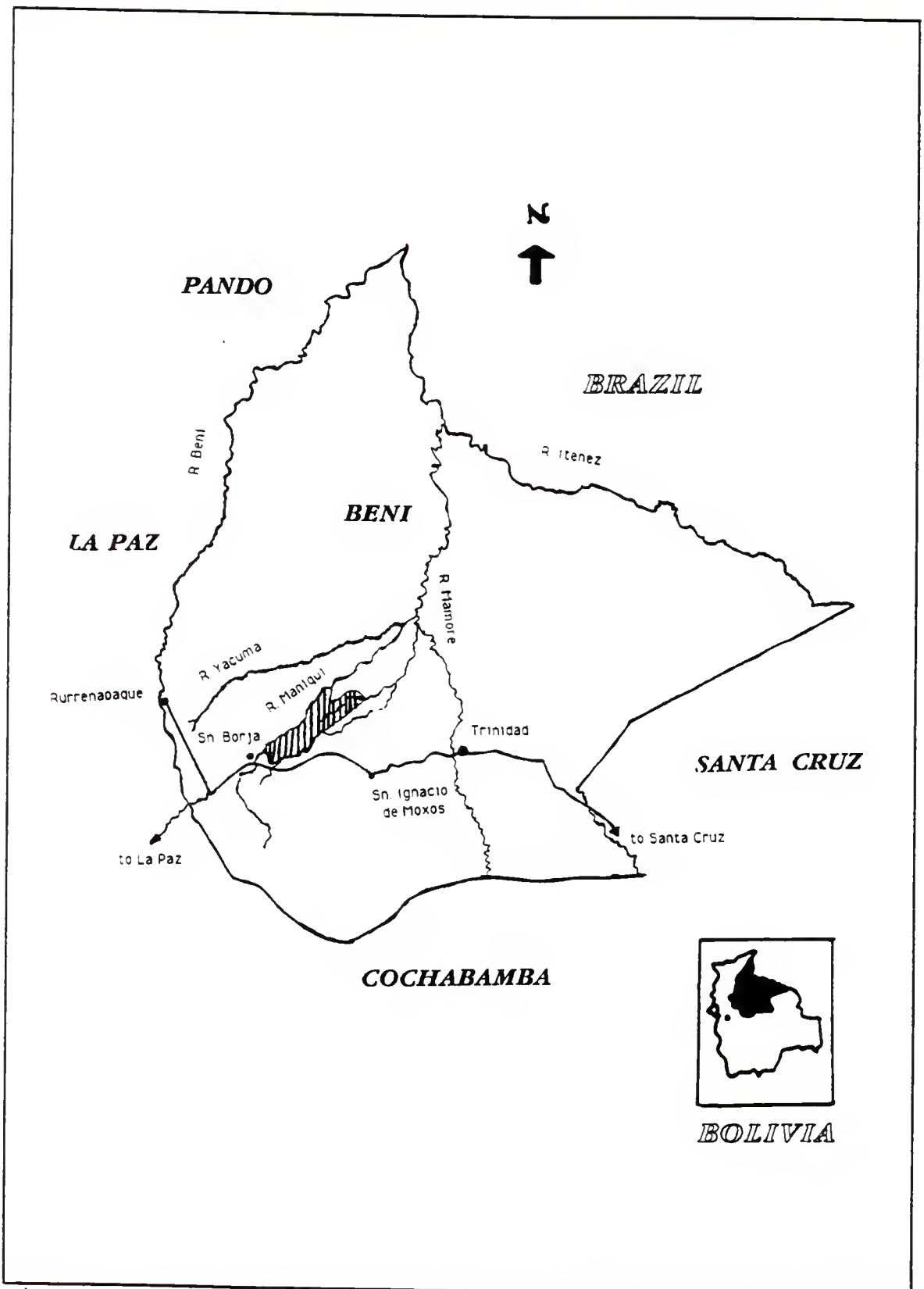

Figure 1.1 Beni Department in Bolivia. Beni Biosphere Reserve shown in shaded area (not drawn to scale).

supervision of the ANCB. This move was to guarantee a scientific approach to the conservation of the area and to avoid bureaucratic delays.

Because the scientists' attention focused on biological diversity, the commission that studied the creation of the Station failed to recognize the presence of the Chimane and peasant populations who had long lived within the newly created Station. It was only a few years later that officials at the Station realized that protection would be effective only if the local populations were integrated into the Station's management plans. Having reviewed the demographic characteristics of the Station, officials presented a proposal to UNESCO petitioning the Station's inclusion in the Man and the Biosphere Program (MAB), a status that UNESCO conferred to the Station in 1986.

The biosphere reserve concept attempts to bridge the gap between conservationists' and local peoples' interests (di Castri and Robertson 1982). A biosphere reserve is a type of protected area made up of a representative sample of major ecosystems which is zoned for various purposes. Zoning, ideally, includes, an undisturbed core area, a buffer zone around the core area where controlled sustainable use of resources is possible, a multiple use or transition zone, and a stable cultural zone where local people live and are expected to carry out only traditional subsistence practices. In the case of the Beni Biological Station, the biosphere

reserve concept seemed to adequately address the needs of reconciling conservation and local resource use.

The Station received further publicity in 1987 when the first debt-for-nature swap engineered by Conservation International, a Washington D.C. non-profit organization, paid for a small fraction of Bolivia's external debt while the government guaranteed improved protection of the area. Although the Beni Biosphere Reserve began to be well-known in the international arena, this was not the case locally. Conservation efforts were carried out without the awareness of the indigenous and non-indigenous people who lived in the Reserve.

To make matters worse, an unfortunate comment by the Bolivian Ambassador to the US stating that "if someone offers us 4,000 million dollars we would give them half of our country" (*Economía*...1988: 8); and the publicity given to an interview, published by the Cochabamba newspaper Opinión, with an officer from the Center of Concern[1] who expressed the view that the external debt in the Third World had already been paid due to years "..of usurious debt service payments and capital flight to the North" (Potter 1988), led to much misunderstanding between conservationists and the general public about the role of conservation and the position of the local population within the Reserve (see *Condena*...1988; *Diputado*...1988; *Reina*...1988). Conservationists' efforts were

[1] Washington D.C. based non-profit organization.

seen by the public as antagonistic to the interests of local people who used natural resources to make their living.

Given this situation, there was a pressing need to have more detailed information about the number of people living in the Reserve, their resource use patterns and the ways local peoples perceived their participation within the Reserve. The challenge to reconcile conservation efforts with the needs of local populations came under scrutiny. This situation was a perfect setting to examine theoretical and practical questions about indigenous resource use, the process of market involvement, and the possibility of conservation of natural resources by local peoples in protected areas.

At the theoretical level, this dissertation examines the question of how an indigenous group responds to resource availability and market involvement; and at a practical level this dissertation explores the possibility of conservation of natural resources in a protected area in the context of diverse patterns of resource use. The main argument of this study is that market involvement is key to the understanding of indigenous resource use. Resource use does not take place in a vacuum; indigenous people are linked to national processes, and are influenced by a number of socio-economic constraints (such as the need for cash to obtain market products) that pattern the way indigenous people use resources for their subsistence. These socio-economic constraints have

to be considered and resolved when integrating local peoples into the management of protected areas.

Scope of the Study

The geographical focus of this study is the Beni Biosphere Reserve, although many other Chimane settlements were visited outside the Reserve in the Upper Maniqui River area and its tributaries. As a primary task, I carried out a survey in the Reserve in order to generate a profile of Chimane resource use. Then, I selected three settlements that I perceived as different in terms of their integration to the market economy and natural resources availability: Puerto Méndez, Chacal, and Chaco Brasil (see fig. 1.2). The regional economy is built around the town of San Borja. These settlements were selected in terms of their location within the Reserve and with respect to their proximity to San Borja.

I expected to find a continuum of market integration, and a set of subsistence strategies in each settlement that would respond to their proximity to market circuits, and to the availability of diverse natural resources. By choosing these three settlements I assumed that each represented a different stage of the same process. In fact what I found was that although each settlement was undergoing change due to the expansion of the internal market, each settlement represented a particular scenario and not necessarily a stage of integration into the market economy. The historical and social

particularities of each settlement prevented their being placed in a neatly constructed "continuum" of market involvement.

Despite this result, I found the comparison among the settlements quite constructive because it illustrated contrasting patterns of resource use, and some common themes within such patterns. Although some findings were suggestive, they cannot be generalized to the experience of other Chimane settlements.

Puerto Méndez

Puerto Méndez is located on the banks of the Maniqui river on the eastern limit of the Reserve. According to the zonation of the Reserve, this settlement is located in the 'transitional' or 'multiple-use' zone.

In 1989, there were about 100 Chimane living there during the rainy season and half as many during the dry season. This settlement is about 8 kms away from San Borja. Surrounding Puerto Méndez there are many non-Chimane people who hold small portions of land that they cultivate along the Maniqui river banks and the road that links San Borja with San Ignacio de Moxos. Therefore, in this area there is competition for available resources, especially land to cultivate, among the Chimane themselves and with peasants from two villages, Galilea and Villa Gonzáles.

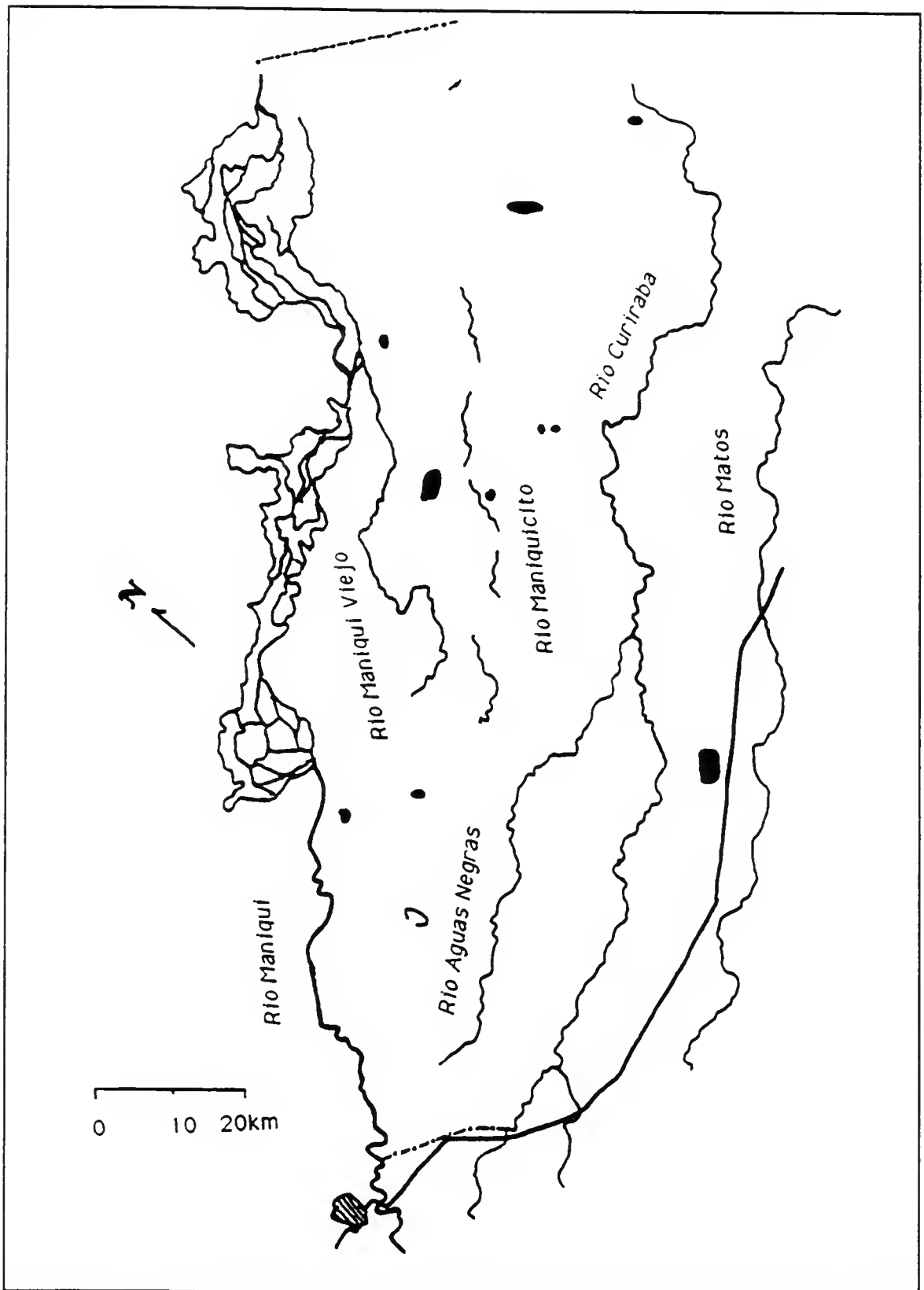

Figure 1.2. Beni Biosphere Reserve. (Adapted from Marco Ribera n.d.).

Many of the non-indigenous people who had land along the Maniqui live in San Borja during most of the year, but often use Chimane wage labor to care for their cultivated land. On the other hand, those who live in Galilea and Villa Gonzáles usually have only one residence. Additionally, there are a number of itinerant traders that visit Puerto Méndez because of its proximity to town. They arrive on foot or in canoes. About once a week, the Chimane from Puerto Méndez go to San Borja to sell their products and to visit with relatives and friends. Cash is used in most market exchanges in town, while only barter takes place when traders visit the settlement.

There is also an Evangelical missionary influence on this settlement. In the late 1970s, a missionary family lived in Puerto Méndez and helped the Chimane set up a school with government support.

Chacal

Chacal, also located along the Maniqui river and in the 'multiple-use' zone of the Reserve, is farther from San Borja than Puerto Méndez (about a day downstream by canoe).

Land constraints are less of a problem here than in Puerto Méndez; the Chimanes are close to savanna areas and to primary forests within the Reserve. There are more available natural resources and less competition to obtain them. There is only one non-Chimane household living next to the Chimane of Chacal, and some surrounding cattle ranches in the savanna.

The Chimanes' sources of cash (or exchange) include the sale of agricultural products, gathered products such as honey, and handicrafts like woven mats that women make.

Itinerant traders from San Borja seldom visit this settlement because it is far by canoe, and the presence of seasonally inundated savanna makes long distance trips on foot very difficult. For the same reason, the Chimane who live in Chacal carefully organize visits to San Borja because they would have to spend the night on the river banks close to town.

Chaco Brasil

Chaco Brasil is much farther from San Borja, about two days downstream by canoe, but close to a rural non-indigenous settlement called El Remanso. Chaco Brasil is one of the northernmost Chimane settlements within the Chimane territory. This settlement is located along the left bank of the Maniqui Viejo river, which is an old course of the Maniqui and a tributary of the Maniqui river. Hunting and fishing resources are relatively abundant and varied in this area, which is also in a 'multiple-use' zone of the Reserve, but close to primary forest.

People from El Remanso often solicit the services of the neighboring Chimane to work in their agricultural fields. Most often they solicit Chimane agricultural produce to consume, to process, or to resell to local cattle ranches. There is also

occasional demand for peccary skins and meat (game). Most market exchanges in this settlement are through barter and in most cases Chimane surplus is extracted through extra-economic means: fear and violence.

The Questions of Conservation and Sustainability

In this work I explore hunting and fishing practices, and relate the harvest yield data I collected to age of the settlement, resource availability, and type of market integration. Moreover, I explore hunting sustainability by comparing harvest yield data to a recent study on suggested sustainable animal harvest rates (cf. Robinson and Redford 1991). Unfortunately, similar information is not available to evaluate the sustainability of fishing and gathering resources because of the lack of ecological studies on species that the Chimane use. The main objective of the study is to identify current indigenous practices to examine the viability of ecological conservation activities in the context of sustainable use of resources.

The concept of sustainability is one that has been widely used since the publication of the World Conservation Strategy by the International Union of Conservation of Nature in 1980 (see Redclift 1987). Sustainability usually refers to the ability of a system to maintain productivity in the face of disturbance. The working definition of sustainability in this dissertation is that which refers to the use of natural

resources to a degree which allows for the reproduction of the species harvested, thus assuring the availability of natural resources for similar benefits in the future. In this sense, sustainable use of resources addresses practices that avoid overexploitation of species which would eventually lead to their local extinction.

Sustainability and conservation are two concepts that are closely linked. As McNeely put it: "Conservation is certainly a precondition for sustainable development, which unites the ecological concept of carrying capacity with the economic concepts of growth and development" (McNeely 1988: 2). Not an homogenous group, many conservationists distance themselves from those who view preservation of natural resources and minimal human disturbance as preconditions for long term availability of natural resources. The former group believe that conservation of resources is an objective that can be accomplished with the participation of the local people who use them.

Previous work on the Chimane (Riester 1976, 1978; Pérez Diez 1983; Castillo 1988) has implicitly argued that the Chimane have a "conservation ethic" because there are socio-cultural mechanisms that prevent overexploitation of resources. This work examines culturally prescribed types of behavior during the Chimane life cycle that may have an impact on the use of resources.

In an expanding market system, the Chimane face diverse situations which compel them to use resources regardless of what is considered conservationist behavior by westerners. Socio-economic factors are pertinent because they define the context in which the use of resources takes place. It follows that policies that regulate the use of natural resources must be formulated in light of the interplay of cultural factors and the socioeconomic opportunities and constraints that condition the manner in which the Chimane extract a livelihood from their environment.

Literature Review

In recent years, there have been a number of studies on the Amazon that attempt to evaluate directly or indirectly the region's potential for development (Bunker 1985; Moran 1981; Sánchez 1982). Many others focus on the sustainable use of natural resources as practiced by local populations, and the key role local people play for conserving resources (Clay 1985, 1988; Davis 1988; Denevan et al. 1984; Padoch et al. 1985).

Other studies in anthropology have focused mainly on the ethnology and subsistence activities of native peoples (see Hames and Vickers 1983; Posey 1985, Posey and Balée 1989; Stearman 1989; Whitten 1976), or caboclo/ribereño communities (Padoch et al. 1985; Hiraoka 1980, 1985); and from a macro-economic perspective, on the expansion of the frontier,

colonization and its effects on the local populations (Aramburú 1982; Moran 1981; Schmink and Wood 1984).

Most of the micro-level studies adopted theoretical frameworks from ecological and economic anthropology, while most macro-level studies adopted a political economy perspective. In the following section I will discuss key concepts that are relevant to the understanding of the patterns of resource use and market involvement among indigenous peoples.

Materialism and Ecological Anthropology

In the late 1940s Julian Steward was concerned that most arguments in the anthropological literature were, in his view, tautological. Cultural patterns were explained by culture. While at Berkeley, Steward was influenced by the geographer Carl Sauer who studied the ecological factors that limited the size, distribution, and permanence of humans in the tropics (Sponsel 1989). Thus, Steward following this line of thought argued that the causes of cultural behavior could be found in the material conditions set by the environnment (Steward 1955). Given a certain set of environmental constraints and a particular technology, in his view, similar cultures arise in response to these limitations. If this were not the case for a particular culture, answers were sought within diffusionistic explanations. The main concern in Steward's work was to understand the evolution of cultures and the

circumstances that favored the development of particular societies under particular material conditions by using the method of cultural ecology.

In the words of Marvin Harris, the strategy of cultural ecology as defined by Steward, "links emic phenomena with the etic conditions of nature" (1968: 655). Steward's materialist perspective of societies has been very influential on much of the work carried out in the Amazon. For instance the seminal works on the Amazon by Betty Meggers, Robert Carneiro, and Daniel Gross have tried to identify those factors that may have limited the development of state-level societies in the tropics.

In the early 1950s, Betty Meggers (1954) put forth the hypothesis that the quality of soils limited the agricultural potential of the Amazon, and thus limited the concentration of large settlements and state-level societies. Meggers argued that most soils in the Amazon were leached and infertile that only permitted limited agricultural activities. Because soils were easily depleted, population density had to remain low, and people had to move often in order to maintain productive gardens that could feed them.

Carneiro (1961) described cases in which Meggers' hypotheses did not hold; some Amazonian groups had adapted to the environment well enough to develop a social organization that could support approximately 2000 people in one place.

This was possible because these groups based their economy on manioc and other high-calorie plants.

One common mistake in these studies was to extrapolate to the past what some native Amazonian peoples are doing in the present. Based on archaeological data, Anna Roosevelt (1989) has been able to demonstrate that not only very densely populated areas were possible in the Amazon (and consequently state-level societies) but that at one point a large portion of the Amazon may have been populated and exploited to satisfy subsistence needs. Widely scattered palm forests provide additional evidence of human influence over the forest (Balée 1988), as does the presence of anthropogenic soils (Smith 1980). Therefore, current native Amazonian resource use patterns do not necessarily reflect what was practiced in pre-Columbian times.

Because the soil limitation theory failed to adequately explain cultural development, scientific attention turned to the acquisition of protein and its implications for settlement patterns and resource use. Daniel Gross (1975) argued that because indigenous people's diet was based on root crops low in protein, they had to depend on the availability of wildlife for food. Gross argued that there was a scarcity of protein in the Amazon, because the distribution of animals was dispersed, and patchy; furthermore, most animals were difficult to obtain because they were arboreal and nocturnal. These provocative statements motivated a great deal of fieldwork to test the

protein limitation hypothesis. Beckerman (1979) counter-argued that mammals are not the sole source of protein among indigenous peoples; if other sources of protein such as fish, insects, palm fruits and the leaves of certain plants were taken into account, the protein limiting factor theory did not hold ground. Moreover, nutritional studies offered additional evidence that disproved the protein limitation hypothesis because many indigenous societies were found to be quite healthy and, in some cases, consumed protein even above the recommended daily allowance set in Western countries (cf. Berlin and Markell 1977).

Some regulating cultural factors that have been associated with protein acquisition and game/fish depletion are warfare (Harris 1984), food taboos (Ross 1978), witchcraft and infanticide (Gross 1983). Recently some have argued that what may be scarce and limiting in native diets is fat and not just protein (Johnson and Baksh 1987). Because a single factor cannot account for the complexity of cultural development, the debate about protein and other single-factor hypotheses has been criticized for being reductionistic (Johnson 1982), and for dismissing cultural patterns as mere epiphenomena (Descola 1988).

Jonathan Friedman (1974) and more recently others (Crépeau 1990; Descola 1987; Godelier 1988) have questioned the cultural ecology framework, and more specifically the cultural materialist framework (Harris 1968) on the grounds of

being reductionist, non-dialectical, and functionalist. Friedman (1974: 444) argues that this type of mechanical or "vulgar materialism" sees cultural forms as determined by the infrastructure defined as demo-techno-economic and environmental constraints (Harris 1980). In this scheme, social relations of production are not considered part of the infrastructure, and therefore they are considered as epiphenomena of technologies and environments. Economic relations are "reduced to a set of adaptive techniques to the natural and biological environment" (Godelier 1988: 49). Marxists criticize this approach because from their perspective, it is key to understand not only how people relate to their environments but basically how people relate to each other to transform nature and produce their livelihood.

The controversy could be better understood when the different levels of analysis are put in perspective. As Roy Ellen has put it: "At one level Harris's brand of 'techno-environmental' determinism involves an obvious truism, but in any concrete analysis of the short term becomes absurd" (1982: 60). Harris's view is correct when explaining determinant factors on behavior from the long-term perspective of geological times. However, in terms of the ethnographic analysis and micro-level studies that anthropologists do, there is a myriad of cultural manifestations such as puberty

rituals or pilgrimages whose meaning cannot be explained by broad generalizations of energy spent.

Johnson (1982: 426) further argues that the debate is centered on the discussion between "proximate" and "ultimate" causes where the ecological level refers to ultimate causality, and the structural and economic levels to proximate causality. Recent approaches to the study of society are trying to overcome reductionism in either direction by elaborating actor-based models of decision-making analysis and by integrating an historical perspective into the discussion (cf. Orlove 1980).

Another aspect of the structural marxist critique points to the functionalist interpretation of cultural phenomena. Many works within the cultural ecology framework have sought to show the adaptive function of certain institutions with respect to their environment, falling again in a tautological trap: if something exists it has a function in the total system, and whatever it is, it is adaptive because it exists. Examples of these functional explanations include Harris's work on the sacred cows of India (1966), Piddocke's work on the Potlatch (1965), and Rappaport's work in New Guinea (1967). By emphasizing the rationality of apparently "irrational" behavior, many works in this framework have produced interesting data on the functioning of social systems. However, by avoiding the examination of contradictions within a society, contacts with industrial

societies, and the history of the population under study, many works were not able to predict trends of change.

In a recent work, Johnson and Earle (1987) have answered the marxist critique of cultural materialism and cultural ecology by pointing out that the marxists are reifying social structures that draw the attention from biology to culture. In their words:

> It is as if they wished to steer clear of any serious discussion of the body, with its insistent animal demands and frequently uncouth influences on behavior (...) Such a cool, intellectualized materialism, avoiding vulgarity by excluding flesh-and-blood organisms from it, might be termed 'effete materialism'. (Johnson and Earle 1987: 9)

Beyond the polemic betwen "vulgar" and "effete" materialists, where the former are accused of reifying the environment while the latter are accused of reifying social structures, there are a number of basic concepts from each camp that are useful for social analysis. By coming closer to natural scientists, cultural ecologists have made an effort to quantify behavior that other anthropologists have coded only as qualitative information obtained through participant observation. This effort has made possible the comparison of cross-cultural data, especially on aspects of production, distribution, and consumption.

Materialists agree that the basis of a society is the production and reproduction of human subsistence. The productive system determines the form of juridical-political and ideological relations, and there is a dialectical (for

marxists) relationship between base and superstructure. A key concept is that of social reproduction:

> In social production people not only produce but also reproduce the conditions of their own existence. Since all production is production within a particular form of society, this means reproduction of labor, reproduction of the means of production, and reproduction of the relations of production. (O'Laughlin 1975: 349)

Eric Wolf further explains that production is not exclusively technology but a complex set of mutually dependent relations among nature, work, social labor, and social organization:

> Marx ... stressed the activity of socially organized humankind in a double sense - active in changing nature, and in creating and re-creating the social ties that effect the transformation of the environment. The term production expressed for him both this active engagement with nature and the concomitant 'reproduction' of social ties. (Wolf 1982: 74)

The concept of social reproduction is also useful because it is a dialectical concept that accounts for processes that must be defined in their own historical, geographical, and cultural context.

Because ecological anthropology focuses on the relationship between people and their environment in the process of production, its interests overlaps with that of economic anthropology (cf. Cook 1973). However, most studies in economic anthropology focus on aspects of exchange of values. Cultural ecology has now become synonymous with ecological anthropology. It is a broad umbrella sub-discipline in anthropology that incorporates an array of theoretical

perspectives ranging from studies testing sociobiological hypotheses (e.g. Hill and Hawkes 1983), to the ethnoscience and symbolical representations of nature by native peoples in tropical areas (e.g. Reichel-Dolmatoff 1976). A recent review on Amazon ecology clearly shows this diversity of approaches in the field (cf. Sponsel 1986).

A theoretical perspective affects the way the investigator poses a research problem and also the methodology that he/she chooses to collect data. In an effort to maintain scientific objectivity, some researchers prefer to focus on specific productive activities without an a priori framework, and then gradually incorporate wider contexts. This research strategy has been called "progressive contextualization" (Vayda 1983). The focus is on micro-level processes and calls for an interdisciplinary effort of understanding relationships between people and their environment. This perspective, however, has the limitation of not accounting for the understanding of the overall problem. In response to this perspective, Schmink and Wood (1987) have proposed a research strategy called "political ecology" which incorporates into the analysis aspects of economics, history, and the social sciences to investigate production systems in a given region. In their words:

> A political economy perspective further draws attention to the relationships between different social groups and to the potential for conflicts which, in turn, may have important consequences for the natural environment. The investigation at this stage also relies on ecology and the natural sciences to specify the environmental impact

> of the forms of extraction and production associated with the various economic activities. (Schmink and Wood 1987: 53)

The political ecology perspective may be a useful tool to understand the process of integration of small populations into wider systems, and the consequences of changing resource use patterns on the environment. This perspective can also help to understand the actual and future role of local populations as managers of fragile ecosystems.

Economic Anthropology and Market Systems

Economic anthropology offers a set of tools to analyze the impact of capitalism on non-western societies. Although the debate in the 1960s between formalists and substantivists (see Leclair and Schneider 1968) was fruitless because social scientists were speaking at different levels of analysis, such as micro vs. macro view, and quantitative vs. qualitative particularities, it served to stimulate research into directions that are useful to understand economic problems among indigenous societies. Thus, according to Orlove (1986), the formalists of the 1960s turned into decision-making theorists, the substantivists into culturalists, and marxists into neo-marxists. This distinction, however, does not mean that there is not still much work being done, for instance, along strictly substantivist lines (see Halperin 1988). Marxists changed their focus from the destruction of 'natural

economies' to the articulation of indigenous societies to the dominant capitalist mode of production.

While the formalists took the individuals as units of analysis, substantivists focused on the analysis of economic institutions. Thus, much of the work done on market systems has been done within the substantivist/culturalist framework (cf. Gudeman 1978; Guillet 1979; Mayer 1974). This is due to their emphasis on the study of institutions and social relationships that shape patterns of exchange.

Historically, there is a distinction between markets (marketplaces) and the market economy (the generalized production of commodities for exchange). Furthermore, Blanton (1983: 53) argues that market systems should be distinguished from border markets. In his view, border markets involve face-to-face exchanges by bartering. The products involved are those which originate in particular environmental settings, and cannot be easily found elsewhere. In contrast, market systems involve the exchange of products between households that are not self-sufficient. This provides evidence of a greater division of labor within a society.

Exchange has been a common feature throughout the history of humanity, but it is only with the development of capitalist production of commodities that exchange becomes a central characteristic of the world's economic system. Culturalists acknowledge a wider range of links between economy and society than did the substantivists. They emphasize that an economy is

not subject to individual volition. Therefore, their unit of analysis is the society rather than the individual and their emphasis lies on the cultural attribution of value. The methods culturalists use are comparative and historical in essence. Descriptions are often given of dual societies that co-exist because each has a particular set of values.

Marx focused on the study of the emergence of capitalism, so his writings on non-western societies are scanty, and often inaccurate (Hobsbawn 1984). Nevertheless, neo-marxist anthropologists have carried out important studies on the impact of capitalism on non-western societies from the perspective of capital accumulation, and articulation of modes of production (cf. Chevalier 1982; Godelier 1988; Meillasoux 1979).

For instance, Chevalier (1982), following Bourdieu's work (1977), outlines the dialectical relationship between base and superstructure; thus, his analysis does not cease in the analysis of production processes among the Ashaninka, but also provides an analysis of the ideological processes of domination and interpretation of their material culture. His work shows the interconnectedness of concrete economic, kinship, and religious practices presenting a holistic anthropological analysis of a particular social formation in Pachitea, in the Peruvian Amazon.

Works written in the neo-marxist tradition reject the dual economy and modernization paradigms while emphasizing the

symbiotic coexistence between the dominant capitalist mode of production and those subordinate non-capitalist modes. When two, or more, modes of production are articulated a transfer of value takes place from the subordinate to the dominant modes. In today's world system the dominant mode is clearly the capitalist mode of production.

Many studies on the Amazon have analyzed the process of integration of the region into the world system by using the concept of frontier expansion. This concept is particularly useful to analyze the spread of trade and market relations. For instance, Foweraker (1981) has interpreted the frontier as the setting in which primitive accumulation and class conflict take place.

The frontier demarcates the range of influence of the nation-state or a dominant group. Frontier expansion refers to the process of gaining more territory, and control in peripheral areas under the direct or indirect influence of dominant groups. The frontier concept has been useful to examine the economic (demographic, agricultural) expansion of the nation state in its search for new markets.

In a classic study on three areas in Russia, Lenin (1979) argued that the growth of the industrial population at the expense of the agricultural population was not a mechanical process. He noted that a large proportion of the agricultural population avoided being absorbed into the industrial labor force by migrating into peripheral areas where they could

reproduce their traditional mode of subsistence. In his view, the spread of capitalism was not stopped but postponed because there were other areas where to migrate, creating "internal colonies" within a nation-state.

The concept of internal colony was inspired by Lenin's work. González Casanova (1965) for the Mexican case, and later Chirif (1980) for the Peruvian case, sought to explain the process of frontier expansion and colonization in sparsely populated areas of their respective countries. Chirif illustrated the nature of the economic role that the Amazon has had for Peru. The Peruvian Amazon was regarded as an empty space by the national government that supported policies that favored the colonization of the Amazon, and the exploitation of petroleum and gas. This governmental view, which prevailed until the 1980s, disregarded the long-standing presence of native populations in the Amazon.

One important work that sought to explain the impact of frontier expansion on native populations was that of Ribeiro (1970). This work has been very influential in later works that have attempted to analyze culture change in the Amazon (cf. Henley 1982). Ribeiro studied the relationship between the native and the national economic structures. He explained that there were different 'fronts' of national expansion: extractive (collection of forest products), pastoral (cattle raising), and agricultural. In Ribeiro's view, indigenous people react differently depending on the type of frontier

expansion they face. For instance, the extractive front is generally less harmful for indigenous people than the agricultural front because the extraction of forest products responds to the demand of a particular commodity in external markets, and once this demand is no longer active, the individuals and companies involved in the extraction of products pull out of the region. On the other hand, the agricultural front is more permanent. The presence of a large contingent of people in areas previously occupied by indigenous peoples triggers the competition for natural resources, the reorganization of land ownership, and the establishment of new social relationships that generally place indigenous groups in a subordinate position, and with less control over their subsistence activities.

In many cases indigenous people in the Amazon have little, if any, legal protection against the invasion of their land. In Brazil, for instance, indigenous peoples are still considered as minors, a fact that reduces their power of lobbying and organizing. In recent years, however, new Amazonian organizations have emerged which have increasingly more power to make their needs and demands heard in national and international arenas.

There are two other concepts that are valuable from Ribeiro's analysis (1973). One is the concept of 'ethnic transfiguration', and the other is the stage of contact that indigenous people face. On one extreme there are the 'tribal

indians' who conserve their ethos and cultural autonomy because their contact with the nation-state is virtually inexistent. On the other extreme, however, there are the 'generic Indians' who have lost their tribal identity, original language, and retain little of their distinctive material culture, because they are integrated but not assimilated to the nation-state. The Cocamilla from the Peruvian Amazon would be an example of this situation (Stocks 1981). Ribeiro argues that although the 'generic indians' are relatively integrated into the nation-state, they are not entirely assimilated because of the intervention of protectionist agent (missions, national parks and others), the attractiveness of being self-sufficient, and the presence of inter-ethnic barriers.

While Ribeiro focused on the ideological aspects of being Indian, Henley (1982) focused on the material aspects that allow people to remain Indian. In his words:

> ...if an indigenous group does manage to retain its material bases, it can continue to survive as a group, whose members preserve some sense of an ethnic identity, despite literally centuries of regular contact with the national society and the loss of most of its distinctively indigenous cultural traits. (Henley 1982: 226)

Thus, land ownership rights are a necessary condition for a culture to maintain viable. It is therefore important to examine the spread of trade and market relations because, historically, this has been the first stage of a process of integration into a nation-state which in many cases has

resulted in the expropriation of territory from indigenous peoples for the benefit of new migrants, or enterprises interested in exploiting particular natural resources.

Natives as Resource Managers

Some researchers stress the fact that indigenous people are true managers of natural resources and rarely random or opportunistic users (cf. Balée 1989; Clay 1988) while others argue that they may use resources in opportunistic ways more often than expected (Colchester 1981; Johnson 1989). The underlying definition of "management" in this debate is that used by natural scientists which calls for a conscious, planned utilization of resources with a view of sustained harvesting. In my view, it is necessary to make a distinction among the resources that are under discussion. Native Amazonians tend to manage resources explicitly with respect to their agricultural/forestry activities, and less so when considering game and fish resources (but see Chernela 1985, 1989; Stocks 1981; Irvine 1987).

Furthermore, although explanatory models can help understand overall resource use in a particular society, generalizations are usually unjust when attempting to represent the highly variable ways of utilizing resources in the Amazon. There is not only a high diversity of ecosystems within the Amazon, but there are also myriad cultural and

economic variables that change over time and affect the use of natural resources.

When engaged in agricultural activities, natives have to make a series of careful decisions to ensure the availability of edible products for a long period of time. Women, men, and children participate in decision making and the garden is the place where experimentation with plant cultivation occurs. Natives have demonstrated their knowledge of the forest by domesticating a large number of plants that they tend in their agricultural fields, household gardens and sometimes in forest patches. Some works have demonstrated that even those fallows that were thought to be abandoned actually form part of a complex agroforestry system in which almost every plant has a useful purpose (Denevan et al. 1984).

Management is less evident in terms of hunting practices. In general terms, most natives go to the forest or fallows to harvest what they can get. There are surely instances when some kind of particular game is preferred, e.g. peccaries or curassows; but after a number of hours of tracking without much luck, other species may be taken.

By cultivating certain plants purposefully, some natives have been able to attract certain species of animals such as peccaries, and most commonly agoutis and pacas, to their fallows or gardens (Linares 1976; Irvine 1987). This practice is a clear manipulation of the environment with the purpose of managing animal resources. Furthermore, some researchers have

argued that food taboos are actually social norms that regulate the harvesting of rare animals (cf. Ross 1978). A corollary of this assertion is that natives have mechanisms that protect species from being overhunted. This trait is put forth as evidence of a conservation ethic. Although this may be the case in some situations, the information on food taboos has to be understood only at a normative level. Indigenous people's behavior is very flexible and often what they say they do is not what they actually practice. In many cases, however, the evidence shows that hunting and conservationist intents among native people are not as compatible as was previously thought (Redford and Robinson 1987). Ellen (1982: 22) further indicates that "..the stable and apparently conservationist strategies of many small-scale societies are largely an illusion", because even the simplest technology can have a significant impact on the environment.

With the exception of the muscovy ducks, domestication of animals had not been achieved in the Amazon at the time of the conquest, although Donkin (1985) argues that when the Spanish arrived in the New World the peccary may have been on its way to being domesticated. Currently, however, it is not uncommon for natives to keep animals encountered in the forest as pets, which serve as a type of security fund to eat when meat is unavailable.

The management of fish resources seems to be more prevalent than that of hunting. Most fishing studies concern

management practices in large rivers or oxbow lakes that many Amazonian rivers form. These practices entail, for instance, the enhancement of fish availability by directly enriching the waters with garbage and human feces, such as that described in the case of Cocamilla fishing in the Huallaga river (Stocks 1983), or by maintaining the natural vegetation along river margins for fisheries maintenance instead of deforesting the area for agriculture. The latter is commonly practiced by the Tukano in the black-water Uaupés river (Chernela 1989). These practices have been put forth as specific cases of sustainable use of resources by indigenous peoples.

Native Peoples in Protected Areas

In the face of the extinction of animal species, there has been a trend since the last century to create areas to protect animal populations which may be endangered. In the past, this entailed the circumscription of a particular area and the displacement of whatever people were living in it. This drastic measure seemed to be the only alternative to protect the viability of endangered animal species.

The impact of the creation of protected areas on native peoples has been very detrimental, to the extreme of causing cultural degeneration and almost physical extinction such as in the case of the Ik in East Africa (Turnbull 1972). The creation of the Kidepo National Park deprived the Ik of their major hunting ground which was the basis for their

subsistence. Once they were moved to a new area they could not sustain themselves; conflicts among the Ik were so severe that they were no longer interested in their continuity as a group but were only concerned with their individual survival. When Turnbull visited the Ik, he was able to document what relocation had done to a once viable indigenous group.

The creation of protected areas is a sensitive issue in many Third World countries because it is often seen as a new form of colonialism with the mask of protecting resources for industrial countries. Furthermore, efforts from international conservation and environmental agencies have helped to generate an elite of intellectual in-country activists that many times are at odds with local people that use the same resources that are intended to be protected. Some researchers have also questioned on ethical grounds the conservation policies that may negatively affect indigenous people (cf. Kingdon 1990).

Some authors (Brownrigg 1985; Clad 1985; Colchester 1981; Redford 1990) have discussed the relationship between conservationist and indigenous objectives. There are basic aspects that make conservationist and indigenous groups "natural allies" against multinational and national elite interests that seek short-term high revenues at the expense of exploiting natural resources. Conservationist and indigenous groups attempt to diminish the impact of penetration roads, hydroelectric dams, oil exploitation and deforestation for

cattle ranches on the environment. Instead, they favor the small-scale use of resources for subsistence needs that presumably would have little impact on renewable resources.

Most protected areas are created in the offices of governmental agencies under the pressures of national and/or international conservationist groups. When local populations learn about the new status of the land they live in, they begin to speculate about the hidden intentions conservationists may have. To have legal title to the land they live in is the first priority of indigenous groups and to find out that this land can be taken away from them for conservationist purposes that they may not understand, is a cause of conflict. People may be willing to work with conservationists in the area where they live if first they are sure that the land belongs to them and to their heirs; land rights are a necessary but not sufficient condition to ensure local people's cooperation in conservation activities. Other conditions should be tailored to the specific conditions of each area intended for protection. In some cases, income-generating projects may be adequate with concomitant efforts on environmental education. The solutions must be worked out with the local people who live in the area to be protected.

Furthermore, the logic of an indigenous production system is totally different, for instance, from that of a logging company. A logging company is only interested in making profits out of selling wood. Once the resource is exhausted,

the company seeks another area where it can do the same because it has the economic resources to do so. A native group has a relationship to the environment which goes beyond economic gain. This is the place where their ancestors lived, where they grew up and where they learned to sustain themselves. Therefore, it is in the natives' interest to conserve their environment to ensure their long-term availability of resources, but it is also the natives' right to incorporate aspects of the modern world into their resource use patterns. The natives may be interested in the adoption of newer, more efficient technologies and also in participating more intensively in the market economy in order to obtain productive or luxury goods that appeal to them. Forcing them to remain "traditional" by developing "sustainable" forms of revenue such as ethno or eco-tourism that exhibits an exotic façade is not a plausible answer to this problem.

Summary

Recent studies on the Amazon have moved beyond the original themes of searching for a single limiting factor of cultural development to more specific studies about current indigenous knowledge of their environment and detailed descriptions of their cultural and subsistence practices. Many works have tried to focus on the more traditional, less contacted, indigenous groups while few have contextualized

indigenous/local resource use in a regional and national political economy with a historical perspective.

There is a need for studies that articulate micro and macro level approaches to the study of resource use. Detailed studies on resource use among native populations have to be framed in the context of cultural beliefs and practices of a particular society, and in the context of new political and economic conditions that are the product of the expansion of the market economy.

The implications of current studies in the Amazon for conservation of natural resources are twofold: they enrich the discussion about the actual and potential role of indigenous peoples in fragile lands, and emphasize the need for a type of development which should arise from each indigenous group's culture and initiative.

In this dissertation I adopt a perspective that attempts to link micro-level data with the larger process of culture contact and an expanding market economy. This work hopes to shed some light in the ways indigenous people should be incorporated in the management of a protected conservation area. By looking at Chimane hunting and fishing, and their relationship with the region where they live I will discuss to what extent conservation of natural resources, and sustainable development for indigenous people can be a reality in the EBB. Ultimately, this work hopes to contribute to a better understanding of the Chimane, by themselves and by others in

terms of their culture, subsistence practices and their struggle to make each day a better one.

Structure of the Dissertation

This chapter has presented the objectives and framework of the dissertation. The central issues of recent studies on the Amazon regarding indigenous peoples were discussed.

Chapter two presents a discussion of the historical conditions that have shaped the current situation of the Chimane in lowland Bolivia. In chapter three I discuss the interrelationships between the environment and the socio-cultural context in which Chimane resource use takes place.

In chapters four and five I present quantitative and qualitative information about the use of extractive resources by the Chimane who live in three different settlements in the Beni Biosphere Reserve. Hunting and fishing harvest yields are analyzed in terms of the resource use sites, time spent, and distance travelled, quantity and quality of game and fish obtained. In chapter six I give an overview of Chimane gathering activities, and an assessment of the overall subsistence patterns.

Chapter seven discusses the levels of market involvement in three Chimane settlements. The analysis of quality of life, and relative participation in the market economy produce a framework to understand the relationship between socioeconomic levels and well-being.

Finally, chapter eight offers a discussion and conclusions on the use of resources and market involvement among the Chimane. The discussion examines the viability of Chimane use of resources in the context of conservation efforts in the Beni Biosphere Reserve.

CHAPTER 2
THE HISTORY OF CONTACT

Introduction

In this chapter I trace the events that have shaped the ways in which the Chimane have participated in and responded to contacts with outside groups in the past four hundred years. Despite the long history of sporadic contact, the Chimane have remained fairly unacculturated due to factors discussed in the following pages.

The Chimane have traditionally lived in isolated groups of extended family households along the Maniqui river, its tributaries and other smaller rivers of the Ballivián province in the Beni department of Eastern Bolivia (see fig 2.1).

Most of the few modern historical accounts of the Bolivian Amazon focus on the Jesuit missions and their impact on the population of the region. Many of the modern cities and towns in the department of Beni had their origins in those missions. In general, the Moxos peoples in the Beni include all the diverse Arawak peoples that the Spanish found when they first arrived in the Beni. The Moxos peoples were among the indigenous groups successfully gathered in missions. The Indians from these missions, more commonly known as

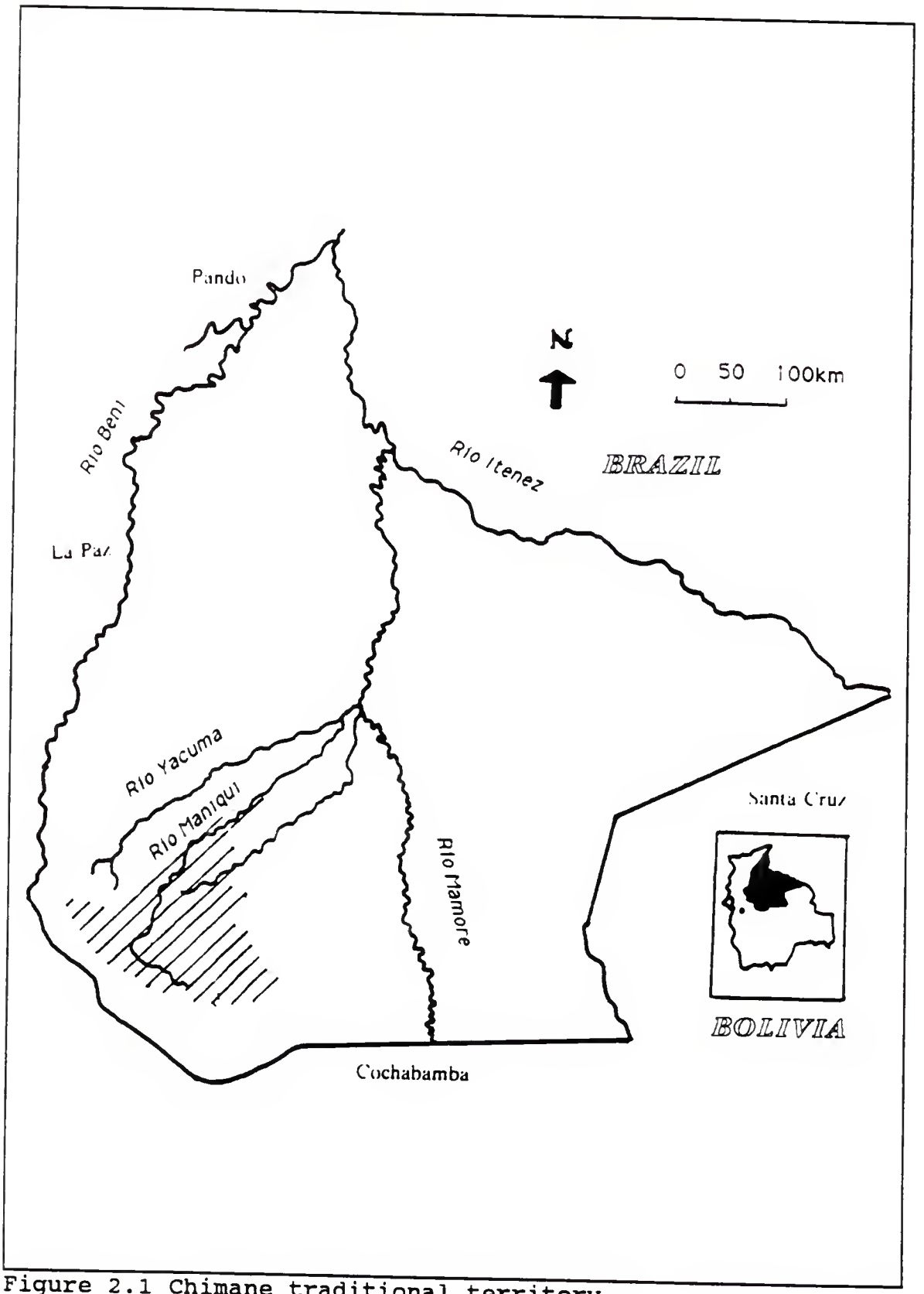

Figure 2.1 Chimane traditional territory.

reductions[1], were most affected in their economic and cultural conditions. The Moxos language was imposed as a *lingua franca* in all the missions of the region.

Other groups such as the Yuracaré, Sirionó and Chimane have been considered as "marginal" or "savage tribes" compared to the "more advanced" groups of the region (Steward 1948). I hypothesize that most early attempts to Christianize the "marginal" groups failed because of 1) their particular social organization which lacked a central authority and 2) because the Chimane used resources extensively, making it impossible to gather all of them in one place for a long time. The extensive use of resources implies that a great variety of resources in a large area are exploited for subsistence favoring frequent, or seasonal moves of residence.

Using the scant information available on the Chimane, I have attempted to trace the types of contact and their impact on the Chimane. One important problem was encountered. A true ethnohistory is impossible because there are no accounts, early or recent, that express the native point of view. Therefore, the first part of this review relies on accounts written by Western explorers, missionaries and other outsiders. The last sections of this chapter incorporate

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[1] Reduction, or *reducción* in Spanish, refers to the mission; to reduce is the verb used to indicate the action of grouping Indians in missions with the purpose of Christianizing them.

information gathered through interviews with people from the Beni region.

Some early sources on the first contacts with native peoples do not specify what indigenous groups are discussed; others use a variety of different names to refer to the same group, which makes the identification of a particular group difficult. The name Chimane has been used more commonly since the second half of the last century; before then, there are accounts on groups named Maniquíes, Chomano, Chimanisa, Rache, Amo, Aporoño, Amoño, Cunana, Tucupi and Muchanes who occupy the general area today inhabited by the Mosetene and Chimane (Aldazabal 1988).

The Mosetene are an indigenous group closely related to the Chimane. Their languages and cultural beliefs are very similar. In fact, some scholars consider that the main difference between them is that one group, the Mosetene, was successfully reduced in missions while the other was not. Chamberlain (1910:192) quoted in Pérez Diez (1989) states that the Chimane are Mosetene in a "savage" state. The Mosetene live today in the lowland eastern side of La Paz department while the Chimane live in the Ballivián province on the western part of the Beni department. The Chimane perceive the Mosetene as their close relatives but they do differentiate them by calling them with the name "Mochane".

The Andes-Amazon Connection

The Moxos peoples were in frequent contact with the neighboring Mosetene who lived in the eastern fringes of the Andes. The Mosetene exchanged ubiquitous products from their region such as salt and stone with woven clothes and other products that the Moxos made (Marbán 1898:40, quoted in Parejas 1976). Furthermore, there is some evidence that there were early contacts between the inhabitants of the lowlands and the highlands. For instance, in the area between Lake Titicaca and the Beni river, there is a predominance of Amazonian zoomorphic themes in pottery, house constructions and systems of belief (Saignes 1985).

Saignes (1985:26) suggests that there may have been a cultural continuum from the Puquina group that lived around Lake Titicaca to some Tacana and Moxo groups around the Beni river. They are all Arawak-speaking peoples, related linguistically and culturally. This relationship could have taken the form of exchange of material goods and symbolic rituals, such as the initiation of Puquina shamans in the lowlands. These groups suffered territorial pressures from the Aymara in the highlands and from the non-Arawak groups in the lowlands, such as the Leco and Mosetene. Arawak groups may have collaborated with the Inca expansion in order to resist the military threat posed by the other groups. To the Andean

dweller, the lowlands represented the inferior humid dark world in their dualist hierarchy. During the 15th century, the Inca army failed to conquer the lowland areas of eastern Bolivia. Although the Inca state did not fully dominate the lowlands, the Quechuas strongly influenced an area that reached the savanna regions east of the Andes. They established tribute centers and nuclei of colonization in their frontier with the lowland groups. While the Incas had heard of the Moxos kingdom, the Guaraní in the south had heard of the lowland Candire kingdom which was also presumed to have vast wealth.[2] The Incas and the Guaraní failed to conquer the area, but the myth prevailed. Later, the Spanish fell victims to the misconceptions about a kingdom of gold and silver, El Dorado myth.

Early Spanish contacts

Soon after Francisco Pizarro and Diego de Almagro had conquered the area of Peru, deep conflicts arose between their supporters. Because much of the conflict was about access and control over gold and silver resources, it became necessary to find new sources of wealth. The thirst for areas with vast wealth led Pedro de Candia in 1539 to seek permission from Hernando Pizarro to begin explorations east of

[2] Spanish explorers hoped to find another state as wealthy as the ones found in Mexico and Peru. El Gran Paititi, el Dorado, Candire and Moxos were some of the few names given to this hypothetical rich kingdom.

Cusco, into the lowlands. The myth of the rich kingdom of Moxos had been accepted as a reality by many. Candia never reached the Moxos territory in the savanna but he confirmed the inhospitability of the area that had to be crossed to reach the savannas. The area was very humid and hot, and the terrain was rough compared to that of the highlands. Many of his men were lost in the forest and never returned. A year later Pedro de Anzures with some of Candia's men arrived at the Beni river area. Many other Spanish tried to explore the region after these first attempts, but most were discouraged by the rugged terrain, the abundant vegetation, and other obstacles to traveling, Most importantly, no precious metals were found that would justify these hardships.

The Spanish presence had a significant demographic impact on the Andean and Amazonian populations. Many natives died of new diseases while many Andean Indians fled their occupied territory into the lowlands; many were adopted into lowland groups (Saignes 1985:74). Furthermore, conflicts among the lowland Indians were frequent but once iron tools and other products were available from the Spanish, new alliances were formed in order to have access to these new goods. The success of a Spanish expedition largely depended on their ability to charm the Indians with goods such as tools and clothes.

The Franciscan priest Gregorio de Bolívar was the first to mention Indians who now live in the Mosetene/Chimane area.

In 1621, Bolívar and Diego Ramírez Carlos from La Paz went to the province of Chunchos.

> The town of Viqui is located next to the foothills of the eastern-most mountains almost opposite and facing the town of *Chomano* head of a province by the same name and where its governor *Apucuitiny* and all the people living there were very anxious to become Christians, and they received me very kindly. This would have been an important reduction if Diego Ramírez's evil and dubious means, as I will later illustrate, had not made everything fail - these people are very kind and very reasonable, well dressed and favorably located: they have behind them the last mountains, and this town is located in the best, strongest, freshest and liveliest place of all this land, not only for themselves, but also for the main town that the Spanish would build... (Bolívar [1621]:186, original in Spanish)[3]

The group in Bolívar's description may have been Chimane who had contact with Andean groups. The "governor's" name, Apucuitiny reveals some Andean influence because Apu in the Quechua language means lord or chief and it can also be a suffix for a deity. Bolívar also visited a group of Indians in the region whose leader was Apocasira ([1621]:197).

Bolívar believed, as many other missionaries of his time, that by giving gifts he could convince the Indians to stay in one settlement. Although this tactic had worked with some Moxos groups, it did not work with groups like the Chimane. They received the gifts but did not feel obliged to reciprocate by staying in one place. Bolívar may have exaggerated the disposition of the Chimane to become Christians in order to obtain permission from his superiors to

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[3] I translated all the quotes from Spanish to English. Members of my dissertation committee made necessary corrections.

begin the evangelization of the group. His account is also optimistic about the possibility of founding a Spanish town in the area, which was not to happen for a long time because in Spain there was little interest in these peripheral regions. Francisco de Alfaro, *oidor*[4] from Reyes, doubted the assertions made by Bolívar because the latter did not distinguish between what he saw and what he heard. Alfaro believed that many of the reports Bolívar heard from the Indians could have been false or exaggerated because "..there are ayllus of six, four, more or less Indians, yet whoever hears about them, may think that these are very large provinces (...), the guides are not faithful and the barbarians also have very delicate state matters" (Alfaro [1621]:211, original in Spanish). There are two important statements in the latter quote. First, Alfaro states that although an Indian may assert that there are four or more ayllus (kinship groups) of Indians, the number of individuals in each ayllu is usually very small; second, Alfaro points to the fact that the "barbarians" may not be faithful to foreigners because they have to take care of their own political interests. Therefore, a kind of political order is acknowledged. A few years later Bolívar and other missionaries went back to the region to begin a mission but never returned. It is thought that they were slain by the natives.

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[4] Judge, member of the Spanish court.

Years later, there were other attempts to missionize the natives of the area. Francisco del Rosario, a Franciscan priest, visited the area of the Amos or Raches (Mosetenes), and the Yuracaré in the year 1666. Rosario mentions the Ucumanos or Chimanes who lived on the Maniqui river (Armentia 1905:102).

In 1639, some years before Father Rosario's visit, the Dominican priest Tomás de Chávez visited and travelled extensively in the Beni region for approximately 14 years. He went back to La Paz and wrote many reports that encouraged other members of his congregation to pursue missionary work in the region that he had visited. These Dominican priests arrived at the Maniqui river from Cochabamba and founded a couple of missions that were later abandoned because of the insurrection of the Mosetene/Chimane Indians in 1696 (Chávez 1986:92).

In the early 1690s there were several missions in the western part of the Beni. A Dominican mission in the upper Maniqui river had approximately 500 individuals, and another mission had 150 individuals. There was also a Franciscan mission called San Buenaventura de Chiriguas and two Jesuit missions, San José and San Borja. The Dominican and Franciscan missions did not last very long because the Indians in those reductions rose up against the priests. The Indians set fire to the building and expelled the missionaries (Armentia 1905).

The Jesuit priests, Francisco Javier and Francisco de Borja who were in San Borja, fled from the mission in the middle of the rainy season before they were attacked. The Indians were reportedly angry because the priests had been unfair and stingy in their distribution of iron tools.

This revolt led by the Mosetene/Maniqui/Chimane group effectively expelled missionaries, except the Jesuits, from their ethnic territory. This expulsion increased the hegemony of the Jesuit missions on the western side of the savanna of Moxos. Although the Jesuit missionaries had left, the Indians in San Borja and San José did not rebel; this allowed the Jesuits to return to those missions.

This insurrection is significant because it may have been one of the earliest concerted efforts by lowland groups to expel missionaries from their territory. Although it was not as effective as the one led by Juan Santos Atahualpa en 1747 in eastern Peru (cf. Varese 1973), this event illustrates early indigenous resistance to missionary/western domain. The natives were open to technological changes and new patterns of consumption, but were not about to accept control by outsiders who brought new spiritual concepts opposed to their own.

The Jesuit Mission

San Francisco de Borja

In 1595, Jerónimo de Andión established the first Jesuit contact with the Moxos people. He participated in an

expedition organized by the governor of Santa Cruz. In their first encounter with the Indians, the Spanish killed all but one of a group of people who were on a beach roasting peccary meat (Vargas Ugarte 1964:11). The person who was able to escape told other indians about the Spanish raid. The Spaniards returned to Santa Cruz when later they saw a number of enemy signal bonfires that meant the enemy was close by.

The scarcity of labor was the cause for occasional raids into Moxos to enslave men to work in agricultural fields in Santa Cruz. In 1667, the Jesuit priest Juan de Soto arrived at the area called Moxos with a slaving party from Santa Cruz. He wrote to his superiors about the region and described the peoples who lived along the Mamoré river (Block 1980; Vargas Ugarte 1964).

The Jesuits received exhaustive spiritual and intellectual training which led them to be very committed to their objective of Indian missionization and welfare. The missionization effort carried out by the Jesuits moved from the southeastern part of Bolivia, Santa Cruz, to the area of Moxos and then westward to the fringes of the Andean mountain range. The first mission, Loreto, was founded in 1682; the second one, Trinidad, was founded five years later on the Mamoré river. By 1744 there were 26 missions which the Jesuits organized in three different sub-regions: River missions, Baures (named after an Indian group), and *Pampas* or savanna missions.

San Borja, in the *Pampas* sub-region, was the sixth mission founded in the year 1693 on the Maniqui river by the Jesuit missionaries Franciso de Borja and Ignacio de Sotomayor. Initial contacts with the Churimanas from this region were carried out by the Jesuit Juan de Espejo who gave them a number of trinkets and tools in an effort to pacify them. Franciscan missionaries had founded a mission in a nearby area called San Buenaventura de Chiriguas. The Jesuits could not permit further expansion by another missionary group in the area over which they hoped to have hegemony, so the Jesuits made a special effort to maintain missions on the western frontier of the savanna. Furthermore, it was thought that this was a passage towards the province of Apolobamba and La Paz. The mission hoped to reduce the *Churimanas* and the *Maporoaboconos* (Chávez Suárez 1986: 249). According to Altamirano ([1699]: 77, original in Spanish) who visited the mission a few years after its foundation:

> There are more than a thousand-two hundred souls; the worst people of all. Cruel, fickle natives, and despite these, they are the most hopeful. The location is good: it is the gateway for many other infidel nations. They do not yet have a church, there is only a chapel where they are indoctrinated.

It was very difficult to missionize the Indians who lived in the San Borja area. They refused to stay in the mission leaving any time they wanted. This mission was very important for the Jesuits because it gave them a western stronghold along with missions from other Catholic congregations. After the revolt of 1696, this was the only mission of the region

that survived, although not with the Chimane (Churimana) Indians. Altamirano ([1699]: 166) seemed to think that San Borja was founded among the Movima, and not the Chimane.

The reduction of Indians in missions led to devastating diseases. Because of an epidemic of influenza, a number of missions were abandoned including San José in the Pampas region and San Pablo on the Yacuma river. The missions that survived were moved to San Borja in 1758.

The population of San Borja was not stable. In an attempt to give an overview of the demographic evolution of the missions, Barnadas (1985: LVI) presented a table which showed that San Borja, during the mission years, had a peak population of 1,824 inhabitants by the year 1713, which declines to 1,256 in 1717; 998 inhabitants in 1748; 799 in 1773, after the expulsion of the Jesuits; and finally increased somewhat to 977 people in 1778. This figure may be an underestimation of the actual population because only those that had been baptized were counted as inhabitants of the mission. Although it is not clear what the ethnic origins were of the inhabitants of the mission, by the end of the eighteenth century the process of indigenous homogenization was well underway.

The Aftermath of the Expulsion of the Jesuits

On February 27, 1767 Charles III, King of Spain, gave orders to expel all Jesuits from his domains. This mandate was

the result of a struggle for influence in the Spanish court (Block 1980: 318). The order was acknowledged in Santa Cruz in September of the same year (Vargas Ugarte 1964: 129). When the Jesuits left the missions, a new wave of European penetration began. Although the Jesuits were replaced by other priests, few of them had the same commitment to Indian evangelization and welfare as the Jesuits. The missions had stopped the expansion of the Portuguese on the east and had also resisted the penetration of *Cruceños* from the south of Bolivia. The Cruceños were interested in accumulating wealth even at the expense of the Indians.

In a few years most missions began to disappear. Aggressive slaving parties from Santa Cruz became more frequent and many Indian groups retreated to the forest. The population in the mission of San Borja dropped from 998 inhabitants in the year 1748 to 799 in 1773 (Barnadas 1985: LVI). When Lázaro de Ribera, governor of Moxos, visited San Borja on November 28, 1791, he suggested that San Borja be incorporated into the mission of Santa Ana on the Yacuma river. Ribera reports a fire that destroyed most of San Borja. There were only 28 remaining shacks (*chozas*), a chapel and 450 people, which included 125 couples with 60 sons and 66 daughters, 49 widows, one widower and many orphans. Communication was difficult with San Borja because of the great number of swamps, and streams of water that surrounded it, especially from November to June. Even during the dry

season it took approximately ten days of travel to arrive at the nearest mission.

Ribera states that the population of San Borja combined with that of Santa Ana (823 inhabitants) would add up to a number of people who would significantly pay tribute to Spain, one large group would be easier to manage than two. He also stated that "the natives of one (San Borja) and the other town (Santa Ana) speak the same language because they belong to the same nation" (Ribera 1791, original in Spanish) by which he meant that they were all Movima Indians. Because there are no references to the fate of the Churimana (Chimane) or Maporoaboconos, one can assume that many fled back to the forest; others may have become incorporated into the mission and lost their cultural identity as Churimana.

In the early 1800s Father Andrés Herrero established contacts with the Chimane but did not convert them (Mendizábal 1932). Two missions were founded among the Chimane in the 1840s, San Pedro and San Pablo. They were located southeast of San Borja. After an epidemic of smallpox which caused the death of many Chimane, there was only one mission left. The latter was abandoned in 1862 when Father Emilio Reinaul was slain by some natives that had not been converted (Cardús 1886: 289). Another missionary effort failed among the Chimane, whose social organization did not allow for centralized leadership, and whose patterns of subsistence were based on extensive use of resources. In contrast, other groups

such as the Moxos had centralized leadership, and their natural resource use patterns were more sedentary because their subsistence system was primarily based on agriculture. This contributed to a more rapid and effective establishment of missions among them.

Cardús reported in 1886 that there were 150 Chimane families who occasionally went to the San Borja *hacienda* to work. He did not explain what kind of activities they performed. Cardús also wrote that some of the Chimane arrived in the Franciscan mission of Covendo to request that a mission be established among them. Cardús expressed his agreement with this request and encouraged the formation of a new mission among the Chimane. This would not happen until the 1950s.

The Republican Era

Bolivia obtained its independence from Spain in the year 1825. All the political turmoil of the time was concentrated in the highlands. Most of Eastern Bolivia remained marginal to larger political processes. After independence, the lowlands were largely neglected by the central power located in La Paz.

Occasionally, armies entered Moxos to obtain cattle, horses, and silver artifacts from the churches (Denevan 1980). There were a number of traders who bought palm-straw hats and cotton weavings from the natives, but soon low-priced European textiles appeared in the market and the native textile industry could not compete against them.

The Beni department was created on the 18th of November of 1842 while General José Ballivián was president and a year after the Bolivian victory in Ingavi which definitely broke the close political connection between Bolivia and Peru. When created, the Beni had three provinces: Moxos, Caupolicán and Yuracarés in an area of 264,000 km2. Ciro Bayo, a Spanish traveller, visited the area of San Borja in 1897 and informed that San Borja had been abandoned by the priests who came after the Jesuits (Vargas Ugarte 1964).

During its initial period, the Beni department lost territory to other departments and to Brazil. Part of the Beni was ceded to Cochabamba in 1854, and another part to Brazil in 1867. In the year 1900, the province of Vaca Diez was incorporated, while 38 years later, Caupolicán and the south of Iténez were ceded to the department of La Paz and Santa Cruz respectively. Acre was ceded to Brazil in 1903 (Carvalho 1978).

The Beni now has eight provinces divided in sections and cantons in an area of 213,564 km2. Navia (1988) recognizes two particular economic and cultural spaces (regions) in the Beni. One includes the central savanna area, and another which includes the nothern forest area initially exploited by the rubber industry at the end of the rubber boom. In my opinion, a third peripheral region in the Beni lies in the western side of the department. It includes the timber-rich forests of the

Andean foothills where rubber is absent, and the gallery forests of the Ballivián and Yacuma provinces.

Until recently, the relative isolation of this region impeded acculturation of the Chimane. It was only with the improvement of air and ground transport that this region became more integrated to the rest of the Beni and Bolivia. In the last decade, this peripheral area has experienced rapid demographic and economic growth within the Beni and one of the fastest in Bolivia.

In the Republican era, the history of the Beni was linked to the extraction of natural resources for national and international markets. From 1840 to 1880 there was a great demand for Peruvian bark or quina, also known as cascarilla (Cinchona calisaya) in the north of the Beni and in the department of Pando. Quina was especially important in the international pharmaceutical industry because quinine was the basis of important medicines to control malaria. The extraction of quina in Peru and Bolivia diminished significantly when the Dutch began to obtain and market a higher quality of quina cultivated from seeds that were taken to Java from Bolivia (Cárdenas 1979:258).

A second product in demand between the years 1880 and 1910 was rubber (Hevea brasiliensis). The mode of extraction of this product required the participation of a large number of laborers who were recruited among native peoples throughout the Amazon. This era had a profound effect on the native

populations leaving deep scars in native demography, social composition, residence patterns and mythology (cf. Collier 1981; Taussig 1988; Weinstein 1983). In the search for labor, a few powerful men armed with guns raided villages and virtually enslaved men to extract rubber. This was one way in which thousands of Moxos and Movima men were recruited to work in the north of Bolivia and Brazil. Some never returned and stayed in the northern areas forming detribalized groups that up to the present live by extracting rubber (Jones 1980).

There are no records about how the Chimane were affected by the forced recruitment of labor at this time. However, one can assume that the Chimane were little affected given their dispersed settlement pattern that made the recruitment of labor less effective. The Moxos and Movimas, on the other hand, lived in towns (ex-missions) which made them an easy target for the *enganchadores*.[5]

Much of the capital accumulated during the extractive booms was reinvested away from the region. Some of it, however, served to cut the isolation of the Beni triggering new social processes with new social actors in the region. In addition to markets in the highland mining areas, the rubber boom created a new market for beef production in the regions

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[5] There were two main ways in which labor was recruited. One was to recruit labor by force. The second was to supply the potential worker with goods (*enganche*) that they were supposed to pay for with their labor. Usually the goods were overpriced and before the laborer was able to pay off the debt, he obtained more goods beginning the debt cycle all over again.

that previously specialized in the extraction of forest resources in the Beni. Moxos and Movima people had learned to care for and tend cattle since Jesuit times. For over one hundred years, they had maintained small herds of cattle or hunted feral cattle in the savanna (Jones 1980). After the rubber boom, when many indigenous people went back to the Beni, a new form of economic activity began to emerge: cattle production for external markets.

Cattle ranches were owned mainly by Bolivian nationals who had begun their fortunes by fencing in the feral cattle that had been roaming in the savannas with no owners for many years. This deprived some Moxos and Movimas people in some areas of access to the feral cattle resource. Some began to serve as laborers on these ranches, where working conditions were often exploitative. The dispute over access to cattle and territory resulted in a revolt in 1887 led by Andrés Guayocho (Cortéz 1989).[6] Some enterprises had more than one ranch or controlled more than one resource. One of these enterprises in the Beni was the Casa Suárez which was involved not only in the extraction of Brazil nuts, but also rubber extraction, and later, in cattle ranching.

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[6] The gradual process of depriving the indigenous peasants of resources of the savanna resulted in a messianic movement that has come to be known as the search of the Holy Hill (*Loma Santa*). Groups of people have left their previous homes and began looking for an ideal place where resources were plentiful.

In July 1931, military president Salamanca used a trivial border incident to break diplomatic relations with Paraguay. Thus began the bloody and costly Chaco War which lasted until 1935. Although the battles were fought far from the Beni, recruiters arrived in the capital of the department and nearby areas to enlist men. Because many men were enlisted, there was a shortage of labor in the fields of the Beni, consequently, a shortage of food as well. The state of panic caused by the recruiters and the growing scarcity of foodstuffs drove many people back to the forests.

Wild fauna for export in the form of live animals and pelts began in the 1940s. The first high demand commodity was the hide of the black caiman (Melanosuchus niger); later it included smaller caimans (such as Caiman yacare), river otters (Lutra longicaudis), and peccaries (Tayassu tajacu, T. pecari). At the beginning, some Indians served only as guides to locate the animals. Eventually, the Indians themselves became active participants in the trade, usually obtaining small rewards in kind from middlemen (Jones 1980).

Two important events occurred in the Beni in the early 1950s: the first was the emergence of air transportation with surplus post-World War II United States military aircraft, and the second was the agrarian reform of 1953. Before the prevalent use of airplanes in the Beni, beef and other cattle byproducts were transported by carts and on the hoof. Because of the perishability of beef, some of the product was

processed into *charqui* (jerked beef) for consumption. Air transportation favored the marketing of fresh beef in the mining centers of the highlands (Denevan 1963).

The agrarian reform, promulgated one year after the revolution led by the *Movimiento Nacionalista Revolucionario* (MNR) in 1952, basically favored those who already owned large extensions of land in the Beni. Large ranches became legal property of those who were able to show the government that they hired wage labor (generally, Indians who had been *enganchados*), and that they had invested some capital in the ranch. In this way, the peasants who were supposed to be beneficiaries of the reform, became legal peons in the so-called agricultural and cattle enterprises (Ormachea 1987: 25).

For the Chimane this decade was significant because in the early 1950s the missionization process, dormant since the 1800s, began again. Catholic priests from the Redemptorist congregation arrived at the Upper Maniqui, and evangelical missionaries from New Tribes Mission began their work in the area of San Borja.

New Missions; Old Aims

The indigenous population of the western side of the Beni department was relatively isolated from the rest of the Beni and Bolivia, but most Mosetene who live in adjacent areas of the La Paz department had been reduced in the missions of San

Miguel de Muchanes (1804), Santa Ana (1815), and Covendo (1842). In 1942, the Apostolic Vicarage of Reyes was founded and began to be administered by the priests of the Swiss Redemptorist Congregation. The Vicarage included the Mosetene missions from the department of La Paz, and the Ballivián province in the Beni.

In 1953, Father Marcelino Hagner, another Redemptorist priest, and four nuns from the Ravasco Order founded a mission among the Chimane, named Caracara, on the Maniqui river. Because of an epidemic, Father Marcelino moved the mission to the area where it is now located on the Chimanes river. He named the new mission Fátima. Father Martin Bauer arrived in Fátima on February of 1958 to replace Father Marcelino whose health was failing. Father Martin has been in charge of the mission ever since. In the mission there is a chapel, a store, a sanitary post and a school. Initially the priest had the intention of teaching the Chimane how to care for cattle. Forty households from the mission received cattle and 50 hectares of forest were cleared. This attempt failed, in Father Martin's view, because the Chimane were not ready for the change. The Chimane like to tend small chacos, but prefer to hunt and fish for animal protein. Taking care of cattle is not labor intensive, but it does require an additional expenditure of time. Cattle can damage agricultural fields; furthermore, cattle ranching is not an activity suited for the ecological region where the mission lies (sub-tropical very

humid forest on hilly terrain). Now, there are approximately 100 head of cattle and 15 sheep, most of them belonging to the mission, and a few head of cattle which belong to a few individual Chimane households.

Another economic activity introduced among the Chimane by the priest was the cultivation of cash crops such as cacao and coffee. The Chimane of the area sell the products to the priest who pays them back either with money or products from the mission store. Some of the most popular items for exchange are fish-hooks, ammunition, pots, thread, needles and machetes. Traders are not welcome in the mission because they usually carry firearms and offer alcohol for exchange. For the past decade, however, traders often have gone into the mission area looking for *jatata*, a roofing material from a palm (*Geonoma deversa*) that is much in demand in the growing town of San Borja. The Chimane collect jatata from the forest and weave the leaves into paños or panels that measure an average of 2.20 ms. These panels are used for roofs.

The health post is attended by a Chimane woman who has grown up in the mission and has some education in first-aid. There are two Chimane male teachers in the elementary school and one Chimane woman who is in charge of small children at the school mission. In the upper levels the classes are mainly in Spanish.

There is a cluster of six Chimane households located next to the mission. In all, Father Martin estimates a total of

sixty households around the mission that participate in the mission activities. During the week, the children attend school, and on Sundays, adults with their children attend Catholic Mass before the store opens.

Father Martin has dedicated the latter years of his life to the mission among the Chimanes and foresees that when he leaves the mission there will be no one else within his congregation to carry on with the work he has now. The impact of the Catholic mission has been limited to the area of the Chimanes river, a tributary of the Maniqui river, and it has not significantly affected Chimane subsistence or cultural patterns. Many Chimane have chosen to stay close to the mission because it offers them some security in the face of aggressive trader incursion. In a sense, although protectionist, the mission has offered the Chimane tools to ease their passage into an expanding market economy by, for instance, favoring the cultivation of some cash crops. Additionally, the store the priest manages offers products at retail price, therefore the terms of exchange are more favorable for the Chimane.

Another religious group working among the Chimane since the 1950s is the Evangelical New Tribes Mission whose headquarters are in Sanford, Florida. This controversial group has taken up the task of filling a niche that Catholic missions had in the early days of Spanish conquest: to contact remote tribes, initiate evangelization, and alleviate the path

of little contacted groups into so-called civilization. Their strategy, however, is quite different than in early days. Missionary families establish residence among the Indians; Evangelical missionaries have the task of translating the Bible into aboriginal languages. This entails the tedious process of learning a new language and learning about the culture to convey meanings. By learning the language and the culture, they are able to communicate better with the natives, making the process of evangelization more effective.

There are two New Tribes Mission nuclei of missionaries working with the Chimane. One, La Cruz, is located on the Maniqui river and the other, Centro Horeb, is located three kilometers from San Borja on the road to Yucumo-La Paz. In 1989, the mission had trained 17 bilingual Chimane teachers who worked in 14 different schools scattered in Chimane settlements along the Maniqui river and its tributaries. All the teachers form part of the Bolivian school system and most are paid by the Ministery of Education and Culture. A few are paid with resources belonging to the mission.

The presence of the Evangelical missionaries in Bolivia has been controversial in the past few years due to their policies of evangelization and acculturation, especially in the case of the Yuquí (see *Encuentro*...1988). In the area of San Borja, their presence has also been controversial but for a different reason. In recent years, one of the missionaries

has begun to take a firm stand against exploitative practices by the traders and colonists that trespass Chimane territory.

Bernard and Elaine Kempf, New Tribes missionaries, arrived in the Beni in the 1950s. They bought the America ranch on the Maniqui river and eventually ceded it to the Chimane who lived there. They now live in Centro Horeb and are active in the social and political affairs of the town of San Borja. The Kempfs are especially involved in helping the Chimane to voice their concerns and claims of justice. In 1988, the missionaries confronted the jatata traders about abusive trade practices in the jatata trade. This resulted in an inter-institutional agreement among the authorities of San Borja, some Chimane representatives, and the traders. The agreement condemns abusive practices and stipulates fairer prices and terms of exchange for jatata. In turn, the missionaries endured the accusations by the traders of being anti-Bolivian and anti-Catholic. The association of traders went as far as denouncing the missionaries at the Human Rights commission office in Trinidad, Beni. However, the accusation fell through for lack of evidence.

The New Tribes missionaries played a significant role in coordinating the formation of a Chimane regional organization. Traditionally, the Chimane have not had a centralized leadership. When conservation and logging efforts began to focus their attention on the Chimanes Forest (*Bosque de Chimanes*) in 1988, it became clear that the Chimane needed an

institution to channel their needs in an organized manner. The missionaries mobilized the bilingual teachers they had trained, by sending written messages to the schools, and by publicizing on the local radio station that a gathering was to take place at Centro Horeb. On March 4, 1989 the Great Tsimane Council (*Gran Consejo Tsimane'*) was officially formed with the participation of 81 Chimane individuals representing approximately 24 settlements.

All officials of San Borja were invited to the inauguration ceremony which began late in the afternoon.[7] Several officials gave speeches showing their satisfaction for the formation of the Chimane organization. They all showed a protective paternalistic attitude towards the Chimane. They congratulated the missionaries for devoting their lives to the Chimane, and for helping them become incorporated in civilization.

Although the organization apparently was autonomous, Centro Horeb was to be the headquarters of the Chimane organization. Any business directed to the organization was to be analyzed and approved by the missionaries. This attitude prevails to the present although there are a few signs that the Chimane will eventually become autonomous. The indigenous movement's petition for territory in the Chimane Forest

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[7] Many officials were late or absent because on this same day the *Leopardos* or Bolivian anti-drug police raided the San Borja airport for cocaine. This event caused turmoil in a normally tranquil town.

certainly has given rise to a new generation of Chimane who are aware of their rights and of the tools needed to achieve justice. However, the question of cultural integrity is still under scrutiny. Evangelization is by nature incompatible with indigenous cultural continuity.

Development Projects

In the past two decades there have been two major projects affecting the Chimane: the colonization project Yucumo-Rurrenabaque and the sustainable timber extraction project in the Chimanes Forest. The Beni Biosphere Reserve is part of the Chimanes Forest complex but was not included in the timber extraction project.

In June 1974, the Bolivian government granted the National Colonization Institute 275,000 hectares of land in the Ballivián province of the Beni to begin the planning and execution of a colonization scheme that would give land to relocated miners and other landless peasants from the highlands. This area lies between the Beni and Maniqui rivers. Most of it was forested areas rich in faunal and plant resources, and the home of numerous Chimane households. Initially, the Colonization Institute had planned to have 84 nuclei. Each nucleus was to have 40 lots of 25 hectares each (Navia 1988).

This presumably "directed" colonization did not develop as planned. Although many individuals filed and obtained

claims for lots, many simply invaded the edges of the main road to cultivate the land. By 1985, there were already 2,650 households living in the area. Most of the families that arrived had no previous experience cultivating tropical lands, and over time their agricultural practices contributed to land erosion and diminishing returns. Rice was regarded as a cash product that would generate income for migrating families. Unfortunately, rice production from this colonization area could not compete with the production of rice from Caranavi and other areas with established markets. As a result, many migrating families moved to other colonization areas, turned to cattle raising, or have begun to extract fine hardwoods illegally with chainsaws.

In the past few years a number of non-governmental organizations, including Evangelical missions have initiated programs of support for the populations that inhabit the project area. Some families have migrated from other colonization areas in the Alto Beni to Yucumo. They have learned from past failures and are putting special effort in trying to make this colonization experience a success. One nucleus, with the support of a La Paz based NGO *Centro de Estudios y Servicios Agropecuarios* (CESA), requested a study to evaluate the agricultural potential of the nucleus where they lived (CUMAT 1988). This effort is a clear statement by colonists realizing the need for practical solutions which

would guarantee the long-term sustainability of land resources.

The impact of this colonization scheme on the Chimane has taken the form of competition for land, and the absorption of occasional Chimane labor for colonist agricultural fields and for construction work. This experience has furthermore favored Chimane mobilization in defense of their land.

While on the western limit of the Ballivián province the Institute of Colonization was shaping a settlement scheme with highlanders, a conservation effort was becoming a possibility east of this area. Armed with the concept that the conservation of biological resources in Latin America can only be feasible when the economic potential of a forest is established, Bolivian conservation agencies with the assistance of U.S. based Conservation International, and logging companies from the Beni began to negotiate to exploit forest resources, mahogany in particular, available in the Chimanes forest.

By the end of the 1970s, the roads from Santa Cruz to Trinidad and La Paz to Trinidad began to be used during the dry season, and the forests on the western and southern parts of the Beni became accessible to extra-regional logging operations. At the same time, fine hardwoods such as mahogany (Swietenia macrophylla), the most important export wood in Bolivia, were becoming scarce in Santa Cruz. Therefore, logging operations began to move from depleted areas into the

Beni. In June 1978, the government declared the Chimanes Forest as a Forestry Reserve, and forbad all logging operations in the area until sustainability studies were carried out.

In 1979, the Civic Committee of San Borja, and later, San Ignacio responded by demanding that the logging companies pay a tax that would benefit the towns neighboring the Chimanes Forest area. Initially, the logging companies and the Civic Committee of San Borja reached an agreement whereby the companies would pay a tax per cubic foot of wood extracted from the Chimanes Forest. In October 1982, a Supreme Decree established an 11% tax for the wood extracted (CIDDEBENI 1989).

In 1986 there were significant changes in the politics of forest extraction in the Beni. First, the Center of Forestry Development (*Centro de Desarrollo Forestal*) in the area of the Beni that was managed from La Paz became autonomous, a move that would benefit local rather than national interests. Second, the Chimanes Forest area was declared a "permanent production forest", meaning that it was open to sustainable logging operations. In the first half of 1987, six hundred thousand hectares were temporarily granted to seven logging companies. Each logging company assumed the commitment of carrying out a feasibility study that would permit it to exploit the forest in an ecologically sustainable form. Once this prerequisite was met, the logging company would have the

opportunity to sign contracts of extraction for 10 to 20 year periods (CIDDEBENI 1989: 25).

The Chimanes Forest area came under international scrutiny when the first debt-for-nature swap was completed in 1987. Conservation International (CI), a US based conservation agency, reached an agreement with the Bolivian government whereby CI bought $650,000 of Bolivia's external debt. In exchange, the Bolivian government committed their efforts to promote the conservation of natural resources in the Beni. CI was invited to participate in a steering committee that would oversee the sustainable use of resources in the Chimanes Forest. This committee was formed by Bolivian conservationist agencies, government agencies, and logging interests. One group largely ignored were the indigenous and peasant people living in the Chimanes Forest itself.

The indigenous response will be addressed in the last chapter because it is an issue that has to be examined in the context of new trends and alternatives for the indigenous people's struggle. Suffice it to say that the Chimanes Forest experience served to mobilize Moxos, Movimas, Yuracaré, and Chimane people into defending their territory and obtaining legal titles to an extension that covers not only their agricultural but also hunting, fishing, and gathering land needs.

Summary and Conclusions

The Chimane were never conquered by external groups. The contact of the Chimane/Mosetene with Andean groups was mainly that of trade or military skirmishes. Missions in the early years of contact were not successful among the Chimane. Even today the proportion of Chimane affected by the evangelization process remains low. However, missions currently play a very important role in supporting the development of a Chimane political organization that is crucial to voice their territorial and human rights demands.

In the early years of contact, ecological and social factors contributed to the relative isolation of the Chimane. First, the access to the territory by land was very difficult because of seasonal flooding, changing river courses, absence of roads, abundant vegetation, and dangerous fauna. Some social factors that hindered the establishment of missions were the lack of a central leadership among the Chimane, dispersed settlement pattern, endogamy, and Chimane extensive use of natural resources. The absence of minerals also kept the Spaniards out of the region. Missions had a demographic impact on native populations. The close proximity of people harbored uncontrollable epidemics causing the death of a great number of people.

The expansion of the internal market in the Bolivian economy also brought new attempts of missionization in the 1950s. In the republic of Bolivia, the missions replaced the state by offering the Chimane not only a new religious affiliation, but also services such as education, sanitary posts, stores, and alternatives forms of production. In the face of a new socio-political situation of demographic expansion (colonists from the Andes, and other landless peasants/miners), the mission has been the only channel that the Chimane could use to voice their concerns. The mission has had, for some Chimane, the role of an institution that offers protection, support, and advice.

Development and conservation projects in the Chimane territory did not initially take the indigenous people into account. The planning of the projects began with the premise that forested areas were empty spaces, and projects would ultimately benefit either new colonist population or local non-indigenous urban people who hold political and economic power in the region. This caused new forms of mobilization among the Chimane and other indigenous groups. The confrontation with logging interests resulted in the promulgation of a decree that deeds land to the Chimane where they live.

Without the support of the Evangelical missionaries and the infrastructure that they offered to hold meetings and communicate information through the bilingual teachers, it

would have been virtually impossible for the Chimane to mobilize and begin to demand territory for themselves.

The organization is very young and the Chimane are still learning through trial and error the necessary steps to negotiate with national authorities. Other Amazonian indigenous organizations from Bolivia have not yet taken the Gran Consejo Tsimane very seriously because of their close connection with missionary interests. This has led to internal conflicts that have been difficult to resolve. The Chimane, however, are at a juncture in which they require all the support they can get. It is a long process to mature politically, especially when information is not in their own hands.

Chimane traditional knowledge lies in the ways they have used resources extensively for generations under a particular set of social conditions. The realization of their own knowledge can further strengthen Chimane organizations. The following chapter examines the environmental setting and the social organization that the Chimane have developed.

CHAPTER 3
THE CHIMANE: NATURE AND CULTURE

Introduction

This chapter outlines the environmental and cultural context in which Chimane resource use takes place. The Chimane occupy an extensive area from the foothills of the Andes to the northeast where the Moxos savanna begins (14°35'S - 15°30'S; 66°23'W - 67° 10'W). Most of the Chimane territory lies in the Ballivián and Yacuma Provinces of the Beni Department. The Chimane typically inhabit areas next to rivers where they can secure water and fish, and preferred agricultural sites. Most Chimane live in the vicinity of the Maniqui River system; there are, however, numerous Chimane settlements next to other rivers such as the Curiraba, Matos, Quiquibey, Colorado, Apere and Shevejecure. These rivers flow into the Mamoré River which, in turn, flows into the Madeira River, an important tributary of the Amazon River.

According to recent estimates (Comisión Socio-económica 1989), the Chimane number over 5,000 people; approximately 800 of them live in the Beni Biosphere Reserve. The Reserve is located in the northeastern-most region of the Chimane territory. Chimane traditional settlement pattern is dispersed, although in recent years it has become semi-

nucleated in certain areas as a consequence of missionization efforts, the establishement of schools, and more market involvement.

Early studies on the Chimane focused on aspects of their material culture and cultural belief (Hissink 1955; Metráux 1948; Nordenskiöld 1924; Wegner 1931), mainly following a cultural diffusionist approach. More recent studies on the Chimane have taken place in the area of the Missions Fátima and La Cruz (cf. Pérez Diez 1983; Riester 1976, 1985). These studies document Chimane material culture, subsistence activities, and cultural beliefs. Cultural beliefs have been documented, mainly, in the form of myths. Two recent studies focus on the inter-ethnic relationships between Chimane and other groups from a sociological (Castillo 1988) and philosophical perspectives (Bogado 1989).

The word *Chimane* has been used by outsiders to designate the indigenous people who live in the Maniqui River area since the early days of contact. In the region of San Borja the Chimane are commonly referred to as *epereje*, which according to Riester (1976: 241), means "one who eats too many plantains". Although the term can be used pejoratively, many people in the area wrongly believe that this term is a word in the Chimane language, and therefore, it is used in a friendly way.[1] In recent years, New Tribes missionaries have

[1] I was once going on a river trip with a trader and his family when we saw a group of Chimane camping on a river beach. The trader's child asked his mother whether those

transformed the word Chimane into *Tsimane'* which is commonly used in the texts they elaborate for Chimane use.

Actually, the term Chimane is foreign to the people we call Chimane. People who are related to each other are referred to by the Chimane as *chätidye'*. The terms used to identify members of their own group in contrast with others are *muntyi'* (male) or *munsi'* (female). However, the Chimane are aware of how others call them, and if they are asked in Spanish what they are they will most likely answer "Chimane".

All the Chimane share a particular culture but they recognize differences among themselves as well. Some Chimane that are more acculturated perceive other Chimane as bárbaros because they still wear clothes made of the tree bark corocho (Poulsenia armata) eat raw fish, and consume little salt. They also are regarded as more knowledgeable about their environment, and therefore, more successful in acquiring natural resources for subsistence. There is, therefore, an ambivalent notion of the "traditional" Chimane among those more acculturated.

There are other Chimane who are more "modern". In general, it is desirable among the Chimane to be able to communicate in Spanish, to be able to read and write, and to adopt patterns of Western consumption in order to participate on more equal terms in San Borja society. It is only in the

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people were Chimane or not. The mother answered affirmatively, and she inmediately added that he should call them with respect: *epereje*.

past few years that as a consequence of land struggle and the emergence of indigenous organizations, the Chimane are becoming more aware of their own identity and the need to strengthen their cultural values.

In the following sections I will discuss material that I gathered during fieldwork but I will also refer to relevant previous work. The focus will be on Puerto Méndez, Chaco Brasil and Chacal, the three settlements in the Beni Biosphere Reserve that are the subject of this study. As discussed in the first chapter, these settlements were chosen in terms of their location, nature of market integration, and resource availability within the Reserve. Puerto Méndez and Chacal were located along the Maniqui river in the 'multiple use' zone of the Reserve, while Chaco Brasil was located on an old course of the Maniqui river in the 'buffer' zone of the Reserve. Puerto Méndez was the closest to San Borja, while Chacal was a day downstream, and Chaco Brasil was two days downstream by canoe from San Borja. San Borja was the center of the regional economy.

The Natural Environment

The Chimane inhabit a vast area that, according to the classification by Holdridge et al. (1971), ranges from wet to moist sub-tropical forest east from the Andes, and gallery forests that extend into the ample savannas of Moxos.

In the wet sub-tropical forest area, the region is somewhat hilly with elevations of over 500 ms above sea level. The hot and very humid climate favors the growth of a high diversity of plants. One plant resource of high economic value in the region is jatata in Spanish or *cajtafa'* in Chimane (Geonoma diversa), a colonial palm that grows in patches and is harvested and processed by the Chimane to make paños, or panels, used to thatch roofs. This palm does not grow in significant quantities in the moist sub-tropical forest, downstream of the Maniqui river in the Reserve. The Chimane affirm that there is a type of jatata of a lesser quality called *boboro*. The latter is sometimes mixed in with jatata when making paños for the market.

Although located in the tropics, the area occupied by the Chimane is classified as a "sub-tropical" life zone in Holdridge's system because of surazos, low temperatures registered. There are low temperatures usually during the months of April through November, but also during other months of the year (see figure 3.1).

According to data collected at the metereological station which is located at the local airport, San Borja is at 193 meters above sea level, Lat. S 14°52' - Long. W 66°45'. The maximum average temperature in 1988 was 28.1°C in the month of November, and in 1989, 27.9°C, also in November. The minimum average temperature in 1988 was registered at 21.2°C in July, and 23°C in July 1989. Between the years of 1977 and 1989,

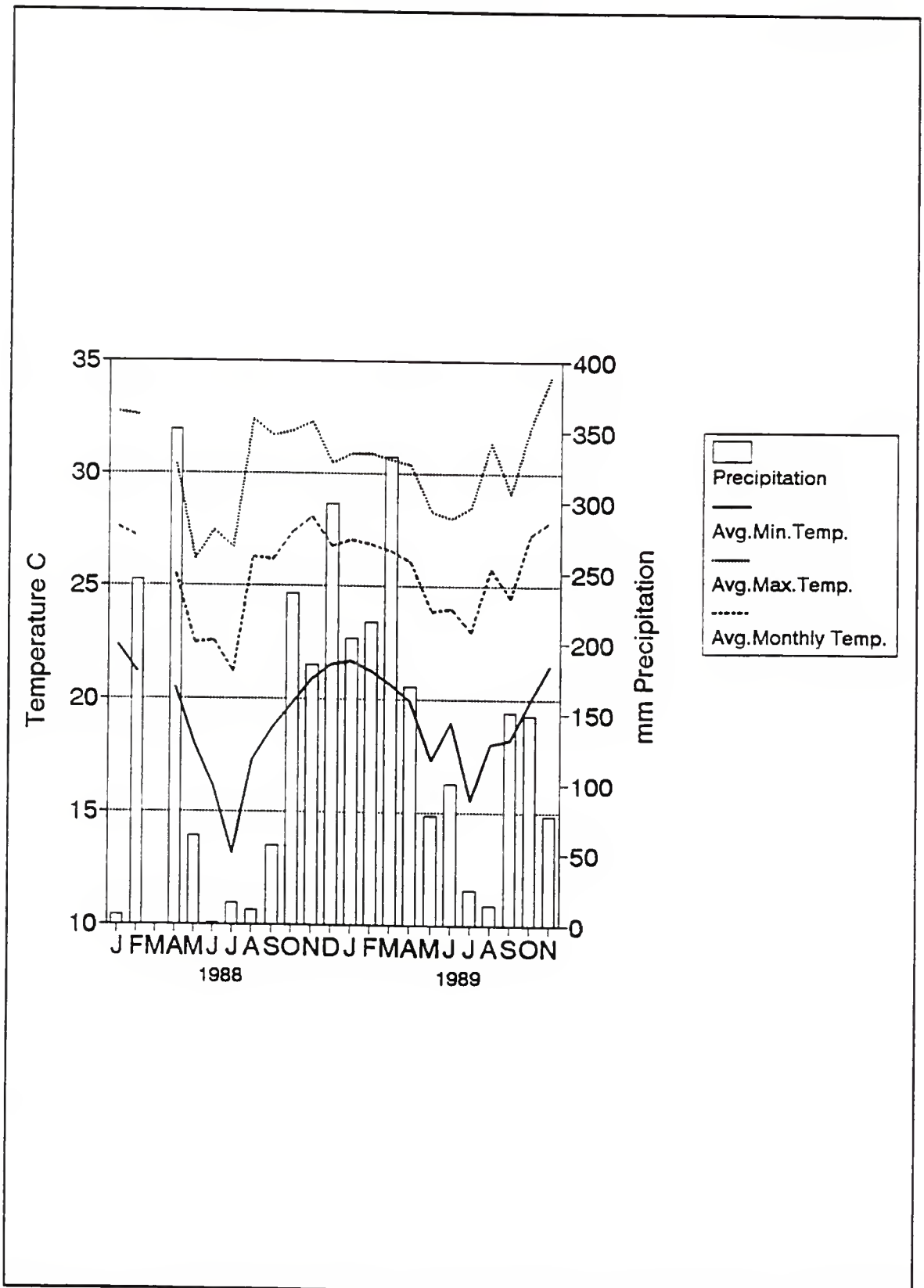

Figure 3.1 Temperature and Precipitation, San Borja 1988-1989 (AASANA 1989).

there were extreme values of 7°C in July 1985, and 39°C in October 1987. Extreme minimum values in 1988 and 1989 were 13.1°C and 15.5°C respectively; both in July. Extreme maximum temperature values were 32.7°C and 34.3°C in January 1988 and November 1989 respectively.

In 1988, the annual rainfall in San Borja was over 1,445 mm, and in 1989 it was over 1,510 mm. April was the rainiest month in 1988 with 351.1 mm while the most rainfall in 1989 fell in March, with a registered value of 331.6 mm.

There are cold spells, surazos, that last up to nine days originated by winds coming from the Antarctic region. These cold spells usually begin with strong winds that can reach up to 60 kilometers per hour accompanied by heavy rainfall (see table 3.1). After this initial event, the weather remains cold with a light rainfall locally called chilchi, or no rain at all. When the wind begins to blow the Chimane seek refuge in their houses which are usually constructed without walls or one wall constructed with *shuru'* (Gynerium sp.) that protects them from the south winds. Winds from the north predominate all year round, while winds from the south and southeast are common from April through August. In late April 1989 a wind from the south caused heavy rainfall (84.1 mm in 24 hours), which subsequently produced a river flood.

When a *tyi'mu* (strong wind from the south) arrives it brings *jätis*, the cold weather. This is a difficult time for the Chimane, for most do not have warm clothing to protect

TABLE 3.1
WIND DIRECTION AND VELOCITY* IN SAN BORJA

	1988	1989
MONTH	WIND DI/VE	WIND DI/VE
January	NW - 6.6	N - 7
February	SSE - 4	N - 4
March	n.d.	N - 5
April	NNW - 4.6	ESE - 3.5
May	SSE - 4.4	SE - 4.2
June	N - 5	NNW - 3.2
July	S - 7	NNW - 5
August	S - 5	NNW - 5
September	N - 7	NNW - 6
October	N - 8	N - 3.5
November	N - 6	NNW - 3.5
December	N - 5	n.d.

Source: AASANA 1989

* Velocity expressed in knots.
Note: mm= milimeters; WIND DI/VE= wind direction - velocity; n.d.= no data.

themselves from the inclement weather. Some wear many layers of light clothes while other just endure the cold next to a warm fire. This is the time when children are most vulnerable and can easily catch respiratory diseases. Most Chimane are always barefooted and those who own shoes wear them only when they go to town. Some own canvas shoes or thongs, and only a few men own rubber boots that they proudly wear in town.

The Chimane who live in the forests of the Beni Biosphere Reserve face a situation that greatly contrasts with the Chimane who live in other areas. The area of the Reserve, from an ecological perspective and for purposes of conservation, can be considered an "island" that is separated from the foothill "continental" forest by an extensive savanna between the Matos and Curiraba rivers. This limits the flow of forest species from and towards the Reserve forests. The savanna is also isolated from the main savanna region located in the Yacuma area. This geographic isolation may in part be responsible for the low diversity of faunal and plant species compared to other tropical areas; for the low density of some species such as jatata (Geonoma deversa), and the great abundance of generalist species of ample niches such as ochóo (Hura crepitans) and motacú (Scheelea princeps) (Miranda et al. 1989: 259-260). There are also patches of some valuable and rare species such as mahogany (Swietenia macrophylla).

An important aspect that affects the natural milieu in the Beni in general and the Reserve in particular is flooding.

There are four important factors that cause flooding in the Beni. One is the lack of a steep gradient. The gradient ranges only from 5 to 30 centimeters per kilometer. Another factor is the presence of outcrops of the Brazilian shield as manifested in river rapids. These outcrops serve as natural impediments to drainage in the Beni lowlands. A third factor is the combination of a flat topography and dense vegetation which obstruct a fast and continous drainage of the water. Finally, many common soils in the Beni lowlands, especially savanna soils, are practically impermeable to water, producing a situation where both flood and rainwater remains above the soil surface for extended periods of time (Cochrane 1973; Hanagarth and Sarmiento 1990).

During 1989, the Maniqui river overflowed its course twice in the San Borja region. In late January it caused great damage to agricultural plots close to the river terraces, and inundated some streets in the town of San Borja and other settlements close to the river. The second flooding took place in April but was not as harmful as the previous one.

In a geoecological sense, the Beni savanna is a transitional region that has been subjected to several climatic changes. According to Grabert (1984, cited in Hanagarth and Sarmiento 1990), the Beni savanna is a geologically young area that was covered by a great lake during the Pliocene and the Pleistocene. The area currently presents characteristics of three different regions: Amazonian

characteristics in the forests, characteristics from the Chaco in drier savanna areas, and some characteristics of the Brazilian Cerrado. There is a predominance of ultisols and oxisols; although most of the forest soils laid down by the Maniqui are entisols, of a recent origin, and more suitable for agriculture (Piland, 1991).

The area of the Maniqui river, especially the Upper Maniqui area has been the core of the territory where the Chimane have developed their culture.

The Culture

In order to unravel the logic behind a society it is necessary to spend a significant amount of time with the people of the society under study. Questionnaires and interviews yield perceptions about the norms within a society but do not necessarily report on actual behavior (see Bernard et al. 1987, on informant accuracy). The anthropologist, therefore, must use participant observation and cross-checking techniques to begin to understand the people with whom she/he is living. Although there are variations within a culture, there also are common patterns that most individuals within a culture share. What follows is a description of the Chimane culture as I have been able to understand it. When necessary I will refer to previous work on the Chimane either to confirm what I have gathered or to point out variations among different Chimane informants.

The Chimane form an isolated linguistic family with the neighboring Mosetene (Plaza and Carvajal 1985). Currently there are two groups of researchers who are carrying out linguistic studies among the Chimane. Wayne Gill (n.d.), an expert linguist and a New Tribes missionary, has put together a Chimane-English dictionary, several documents on language and cultural characteristics, and more recently, an abridged Chimane-Spanish dictionary. These have been done in addition to translations of passages of the Bible into the Chimane language. In recent years Herminia Martín (1987, 1988), a linguist from the *Centro Etnológico Americano* of Argentina has begun the analysis of the Chimane language in terms of its similarities to the Mosetene language, and other characteristics particular to the Chimane. Neither researcher has yet been able to establish the origin or relationship of the Chimane language to other lowland South American languages, although Pérez Diez (1984: 17) following Key affirms that linguistically they form part of the Macro-Pano with the Gé-Pano-Carib group.

Unfortunately, there is little archeological work done in the area that the Chimane inhabit. Denevan (1980) speculated that the mounds and raised fields found in the area between San Borja and San Ignacio de Moxos might have been constructed by the Chimane or an ancestral group closely related to them. Due to the high humidity of the area and the consequent perishability of the material goods that the Chimane own, it

was very difficult to study the archeology of the area. However, because of the development of better techniques to carry out archeological work in the Amazon in recent years, there is a better possibility to find answers to the early presence of the Chimane in the Beni. It is not uncommon for a Chimane agriculturalist to find old stone axes when working on a field, or next to a river bank. As mentioned earlier, the migration of the Beni rivers causes the erosion of pieces of land that were sites of old Chimane or other Indian groups camps.[2]

Social Organization and Life Cycle

The Chimane have a kin-based social organization that makes distinctions between gender and the generation of the relatives. This is a Dravidian kinship system (cf. Lounsbury 1968) because it accounts for those cross cousin relatives and parallel cousins in ego's generation, and also accounts for bifurcate collateral relatives in ego's +1 (ascending, or ego's parents') generation. In ego's -1 (descending, or ego's children's) generation, there are also distinctions made between those children from parallel relatives and those from cross relatives' children. Cross relatives are also potential in-laws. The preferred type of marriage and the most common is

[2] On March 1989, while going to Chaco Brasil downstream from San Borja, the Chimane travelling with us spotted a large clay pot which had been buried a few meters underground, but had been uncovered by the erosion that the Maniqui had caused. The pot contained human bones of an unknown age.

with one's cross-cousin: *fom'* (i.e. MBS, FZS; MBDa, FZDa, etc.). Marriage with parallel relatives is generally avoided, and rarely occurs. For instance, the Chimane tolerated the relationship of one Chimane man who had married his *tsédye'* (MZ), but the fact that after 10 years of marriage the couple only had been able to raise one child, while three others had died, was attributed to the misfortune of being engaged in an incestuous relationship. Referring to this case, a Chimane woman ascertained that when this couple die, they will not go to *mayedye'* ("heaven"), but their spirits will wander on earth as punishment.[3]

The kinship terminology for male and female ego's +2 generation is less specific than with relatives of a closer generation. The term used to refer to all male relatives of the +2 generation is *viyá'*; and *jäye'* for all the female relatives. From a male ego's perspective all of those in his -2 generation (male and female) are called *uiyá'*, and from a female ego's perspective, *jäye'*. The generational distance between ego and ±3 relatives is indicated by calling all male and female relatives by the same term: *voshi'*.

The conjugal household is the minimal unit of production and consumption among the Chimane. Potentially, these are self-sufficient households that can, and occasionally do, live isolated from other Chimane households. There is, however, a preference to live next to other relatives' households,

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[3] This may be a comment influenced by Christian beliefs.

forming extended family clusters of several households. Each household maintains its own hearth, cooking its own food but frequently sharing with neighboring households. These extended household clusters are usually formed around an older couple, or an elder, who has hierarchical influence over the rest of the members of other households.

Of the sample of 44 Chimane extended households surveyed in the Reserve, there were only three cases of polygamy, two of them sororal polygyny, and one case of fraternal polyandry. The latter is a very rare case. The children that this woman bore had, in their belief, two fathers and there was no distinction made between the two husbands. In the Reserve there was also one case of levirate; whether this is an institutionalized feature among the Chimane remains to be further explored. In general, the Chimane form monogamous relationships, although adultery, separation, and the formation of new monogamous relationships are not uncommon features in their personal life.

Generally, a man asks the woman he likes to marry (live together with) him.[4] In some cases, I was told that a man may ask his own father to talk to the woman's father about the establishment of a marriage alliance. A woman is ready to get married after her first menstrual period, a man after he has demonstrated that he is able to sustain a family by working in

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[4] Riester (1976) affirms that it is the woman who chooses the man she wants to marry. I was not able to confirm this assertion in the Reserve.

an agricultural field and is competent at hunting and fishing. In most cases, the man who marries into another extended household cluster is expected to live with the woman in her cluster and help the rest of the extended family in productive work. There is not a specified amount of time he has to contribute to her extended family, and the couple afterwards may establish residence where they wish. A married woman is expected to process and serve food for her husband, wash his clothes, and take care of all the domestic tasks that pertain to the household, such as taking care of their children, and cleaning. She also contributes to productive activities such as gardening and gathering.

A married woman maintains her own hearth. In an extended household, the hearth may be shared between two women of different generations: mother and married daughter, or mother and son's wife. In the latter case, sharing a hearth with a mother-in-law is a potential source of conflict and is generally avoided.

A pregnant woman usually works in her agricultural field and other household tasks until the time when she gives birth. There are a number of norms (*micdyi*: avoid/ do in moderation) that prescribe the kinds of food she should eat and the actions she and her husband should take while pregnant. For instance, a pregnant woman, especially if she is pregnant for the first time, should not eat any fish that has sharp teeth such as *irimó* (Serrasalmus sp.) because it can cut the

umbilical cord and kill the baby. Other fish such as *tchaé* (Colossoma macropomum) and *ivijnadye'* (Phractocephalus hemiliopterus) are taboo because they have a large "head", and so the baby can develop a big head making labor difficult for the mother and child. In general most large animals such as tapir, deer, giant armadillo and giant anteater are taboo, while small species are not. The reasoning is that it is desirable to have a healthy but small child who will be easy to deliver without endangering the mother's life. Honey is another food prohibited to the pregnant woman. In the settlements more integrated into the market economy, the Chimane have added some other products to the list of tabooed foods. Noodles, chewing gum and bread should not be eaten because of the "sticky" texture they have which could cause a baby to get stuck in the mother's womb.

When a man returns home from the forest to his pregnant wife, he has to unfasten his bow, and go directly to the hearth to purify himself from negative energy he may have gathered in the forest. As in other cultures, the man has to comply to his wife's desires for certain foods (as long as they are not taboo), and be able to satisfy her, or else the woman and the child will suffer. A woman who likes to eat a lot of red meat and is irascible while pregnant is thought to carry a baby boy. On the other hand, a woman who likes to eat a lot of fish and sugarcane will have a baby girl.

Pregnant women are considered to have a special strong scent that may neutralize the power of certain products such as fish poison. Therefore, pregnant women are not expected to participate in fishing expeditions. Moreover, pregnant women should not look at twins (*epoj*), or else she would also have twins (an undesirable situation). Lunar and solar eclipses are harmful for the pregnant woman, and she should remain inside a hut when they take place.

If taboos are followed carefully, especially with the first child, it is thought that the process of labor and birth will be less painful for the mother and the child. Once a child is born there are a new set of rules that the Chimane follow to ensure the well-being of the child and the mother. A woman gives birth with the help of her mother or other women who assist her. Occasionally her husband or other men are present. She takes some alcohol when available to withstand the pain. Some claim that having water with salt will also ease the pain. The woman in labor positions herself squatting and holds onto a rope that is tied to a transversal pole inside her home. If labor is difficult, the assistants "help" the parturient by pressing on her abdomen until she gives birth. The umbilical cord is cut with a clean *ton'* (tacuara/bamboo) knife, and the baby is carefully cleaned. The placenta is usually buried near the house in a clear spot next to the placentas of her other children (when possible). Presumably this ensures the baby's survival.

Once the woman gives birth, she and her baby remain inside the mosquito net for at least seven days, without going out even to defecate. If her home has no walls, her husband tries to make the area darker with palm leaves. Sufficient time is given to the woman and the child to recover from childbirth. Other women or her older children take up the tasks of cooking and cleaning for the household. Meanwhile, the woman's husband has to sleep in a different mosquito net for several months. The amount of time they have to sleep separated ranges from one to four months depending on the rate in which the child becomes strong, assuring his/her survival. A man should not have sex with his wife or other women or the baby will not be healthy. This is a norm that in many cases does not reflect actual behavior. Couples who are aware of this norm yet sleep together too soon are said to be irresponsible parents who reject the child. This is supposed to have an effect on the father who will become *to'oty*,[5] or unable to work, for not complying with the norm.

During the first two months a woman and her child have a strong "scent", and she has to eat and drink from a separate plate and gourd that must not be shared with anyone. If someone drinks or eats from the same source as the woman, this person runs the risk of becoming *to'oty*. A woman who has just

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[5] The English word lazy does not do justice to the Chimane meaning. According to the Merriam-Webster dictionary, lazy means "disliking activity or exertion". In the Chimane sense, it means that the person becomes unable to work for reasons beyond his/her will.

given birth should not make manioc beer for the same reason (the same applies to women that have their menstrual period).

From an early age girls and boys are socialized to perform the duties that they are expected to carry out when they are adults. Girls help their mothers fetch water, and have a "play" container for this purpose. The girl holds an *érepaj* (gourd) with seeds, while her mother is using a digging stick to plant rice or maize. She helps mother spin cotton, put the chickens in their shelters at twilight, and when there is a small sibling, she usually takes care of a baby sleeping in his hammock, or holds the sibling while mother is performing other tasks.

On the other hand, boys are busy playing with small toy bows and arrows, and try their luck catching small fish by the edge of the riverbanks. Children are also helpful controlling pests such as birds that eat the rice which is about ready to be harvested. In the settlements where there are schools, boys are more encouraged to attend school than girls. This is a situation that contributes to the undermining of women's status within the Chimane society.

Some women say that it is better to have boys than girls because they go fishing and work in gardens, providing more food. A few say they prefer to have girls because they do not get drunk and violent like men do. Overall, infanticide seems to be a rare occurrence that, at any rate, is very difficult to document. It is true, however, that some women neglect the

children they have had of previous unions when they are engaged in a relationship with a new man. In such cases, grandparents play a crucial role in the socialization of children, for they usually assume the role of parents of these neglected children.

In the event of illness, the Chimane first try household remedies that consist of herbs and plants. Knowledge of household medicines is widespread, especially among women. When an illness persists the next step is to require the services of a *piñitucsity*, healer specialist. This person can be a man or a woman who combines the use of medicinal plants with tobacco, coca and alcohol. There are different forces that can provoke illness such as *jäjäbä* (owner of the animals), and most commonly *o'pito'*, the rainbow, which is said to control and withhold fish from the Chimane. A *cocojsi'*, or shaman, can also heal but his powers are supernatural which are manifested in healing rituals to "suck" out thorns and straws from an ailing body. Traditionally, he led the rituals in a cult house called *shipa*. Because of culture contact and aggressive rejection of these practices by Bolivian nationals, these cult houses are hidden and, reportedly, there are only a few of them left.

O'pito' is usually encountered in sources of water. All Chimane are susceptible to o'pito's power, but small children are particularly vulnerable to this force. When the latter are taken along on gathering or visiting trips, adults usually

take a firebrand as a measure of protection against evil spirits.

In the event of death, the Chimane usually abandon their houses and build a new one in a different place. In the past, this change of residence also implied the abandonment of the settlement and the establishment of a new home in an area where they had access to new resources. The Chimane believe that after a person dies, this person's *onojnodye'* or his/her soul, returns home because it feels lonely and, therefore, it can bewitch another family member provoking death. Presently, those communities that are more integrated into the market economy prefer to remain in their settlements but they opt to move their homes at least a few meters from the previous location.[6] In some cases, a household would temporarily move to a new location even when one member of the household is very ill because his/her *onojnodye'* has left the person for a while. When the person gets well, the family returns to their original home.

When a person dies, no one in the extended household cluster should work. A child died in Chaco Brasil in May during the harvest season of rice. Her family mourned her

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[6] In most cases, it is not a matter of choice but of necessity. Many settlements suffer land constriction and, therefore, cannot move very far.

death and left part of the rice field unharvested, causing a serious impact on the household economy.[7]

The concept of *carijtacdye'*, or work, applies to such activities as those carried out in the agricultural fields, the production of *shocdye'* (manioc beer), and manufacture of *shipna* (woven mats), among others. Agricultural activities are carried out by men and women, and the other two by only women, with a few exceptions. On the other hand, activities that are mainly carried out by men such as fishing and hunting are not considered work, and can, therefore, be the source of subsistence while mourning a deceased relative.[8] Gathering, performed by both men and women, is also permitted during the mourning periods.

The Chimane usually bury their dead in areas of old unused fallows. Traditionally, a dead person was buried wrapped in the blanket the person usually used, or his/her mosquito net. Sometimes the Chimane still do that and when possible they construct a coffin out of pieces of wood. They bury the person with his/her more personal possessions such as his/her clothes. Some of the most important objects that are left at the grave include a gourd with water, a plate with food, and an artesanal kerosene lamp. At a child's grave, there was also a plastic jug. I was told that this child used

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[7] The rice lost amounted to approximately 600 kilograms (Piland, personal communication).

[8] *Nati* means to "go for a walk" in the forest: hunting.

to fetch water in this container which is why they put it at her grave. These objects are supposed to make the dead more comfortable in their new condition and will help them on their trip to heaven.

When the Chimane visit the cemetery they greet the dead *yómoi' tyä chätidye'*, or good afternoon relatives; then they proceed to weed the graves for they usually plant flowers around the area. Some of the graves also have small roofs built on top of them, and some have a cross that identifies the grave. In one visit, the grave of a child seemed to be empty. The Chimane, alarmed, affirmed that the child had left and had been born again as an *itsiquij*, or a jaguar, one of the most feared and magical animals of the forest. As they leave the cemetery, the Chimane say good-bye to their dead relatives.

Settlement and Community

In the past, the Chimane have been regarded by outsiders as a nomadic group. Although most Chimane households are very mobile, it is also true that most of the moves they make are within their own ethnic territory and within particular "boundaries" for each extended family cluster. For instance, the main settlement is usually near a river for most of the year. During the dry season some Chimane households move to live on river beaches to make use of fishing resources, and during the wet season some households may move into the

forest, to make use of hunting resources. It is a common attribute of Chimane social reproduction to pay prolonged visits to relatives. These usually take place during the dry season, and are combined with economic activities such as fishing or gathering. Some households that are more involved in the market economy seasonally move to work making agricultural gardens for patrons in ranches.

Given the patterns of extensive use of resources, and the near self-sufficiency of each household, the notion of community is potentially misleading when applied to social relationships between Chimane households. Despite of generalized reciprocity among households, the Chimane are highly independent and do not necessarily pool resources above the extended household cluster level. In recent years, land constriction has made it necessary to begin to speak of communities. In this sense, the community level functions as a response to outside conditions such as the establishment of schools, or the transactions that are necessary to negotiate to obtain land titles.

Traditional leadership usually consisted of the elders or a few outspoken Chimane within an extended household cluster, but there is no evidence of the continued presence of leadership over several Chimane clusters.[9] The recent creation

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[9] Some researchers (cf. Riester 1976; Castillo 1988) affirmed that there were leaders called *konkasiqui* (peculiar similarity with the Spanish word of Caribbean origin *cacique* which means "Indian leader"). I have not found evidence that supports this assertion. The word seems to derive from the

of a regional Chimane organization (*Gran Consejo Tsimane'*) made it necessary to elect formal leaders who would respond for the settlement's welfare. A settlement typically consists of one or more extended household clusters. The election of a settlement leader, or *corregidor*, is an attempt by the national society to establish some social control within native settlements. This causes a conflict within a settlement when they cannot agree on a suitable person to do the job, because electing a leader would imply the hegemony of a particular extended household cluster. In Chimane society, the lack of formal leaders permitted the resolution of interpersonal conflicts by consensus at an individual level; but with the presence of an imposed leader, conflicts may be aggravated rather than resolved.

Chimane Settlements in the Reserve

The Beni Biosphere Reserve begins a few miles away from the town of San Borja which has approximately 13,000 inhabitants. The Reserve is also near the road which links San Borja with the town of San Ignacio de Moxos and Trinidad, capital of the Beni department. The headquarters of the Reserve lie in the ranch called El Porvenir, next to the main road some 50 kilometers away from San Borja. Because El Porvenir, which lies in the savanna, has been the gate of

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verb *cojcaqui* which means to control, rule over or take care of someone or something. However, there is another word in Chimane that means leader: *ayo'*.

entry for most researchers who have visited the Reserve, the number of Chimane settlements in the forest areas has been under-reported.

Early reports written for the Reserve asserted that there were only 20 "nomadic" Chimane families living in the Reserve who practiced "incipient agriculture and subsistence hunting, fishing and gathering" (EBB n.d.). As the need to know the local population grew, other studies were carried out which focused on documenting the heterogeneity of the local population composed not only of Chimane but of peasants and ranch personnel (Diez Astete 1988a; Redford and Stearman 1989).

In 1989, there were approximately 120 Chimane households within the Reserve comprising about 800 individuals distributed in five different recognizable areas (see fig. 3.2).

The first area consisted of those settlements closer to San Borja: Puerto Méndez and San Antonio, along the Maniqui river. Puerto Méndez and San Antonio are more populated than other settlements in the Reserve and are more integrated into the regional market economy. These communities suffer encroachment on their land by mestizo agriculturalists. Itinerant traders from San Borja prefer this region to carry out their business because of the easy access to the area on foot or by boat. In this area, agricultural fields are larger than in other areas of the Reserve (Piland 1991). The most

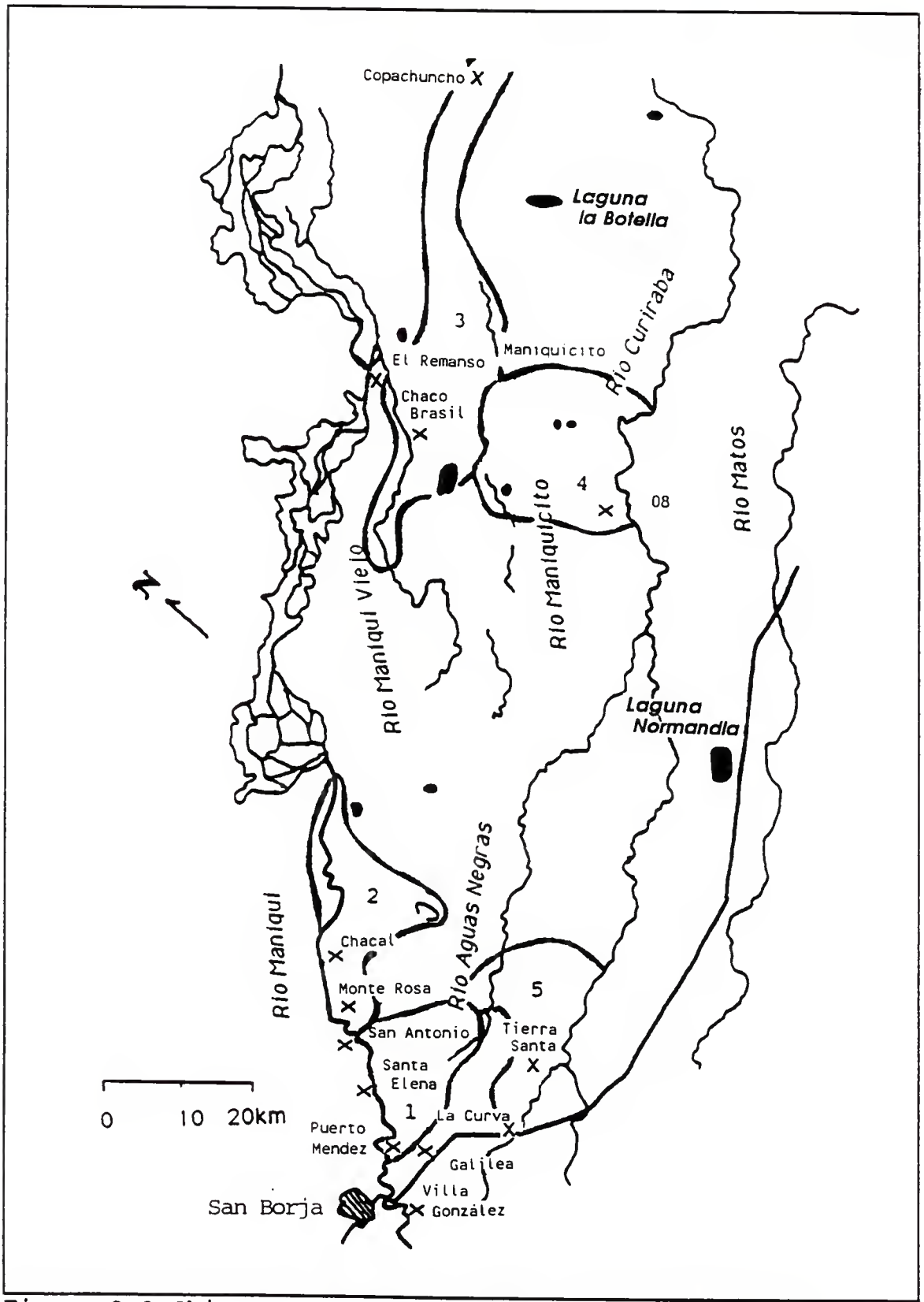

Figure 3.2 Chimane Settlement Areas in the Reserve.

important cash crops are rice and plantains. Fishing is the main Chimane source of protein, which is available year-round in the Maniqui river, oxbow lakes, and seasonal streams. Hunting is less rewarding in this region than in the others. The most important game animals are agoutis and pacas that are usually hunted in or around agricultural fallows. Gathering of forest products is an important activity in this region. Women actively participate in the collection of seasonal palm fruits, and reeds (*Gynerium saggitatum*) which are used to make woven mats that can be sold in town and nearby ranches. During August, turtle eggs are commonly collected.

The second area is downstream from the first one. It includes the Chimane settlements of Campo Bello, Belén, Monte Rosa and Chacal, along the Maniqui riverbanks. This area is farther away from San Borja and the presence of flooded savannas makes access by foot from the nearby town almost impossible. Itinerant traders occasionally visit this area by boat.

The proximity of savanna and forest areas give the Chimane who live in this region the opportunity to use a wide range of resources. The main cash crops are rice, plantains and to a lesser extent, manioc and maize. The most important game animals available in this region include peccaries, monkeys and birds. Hunting parties are often organized to go into the forest for a few days with the specific purpose of obtaining much desired peccary meat. People fish almost daily

with hook and line on the Maniqui river. Women organize trips to gather products such as reed. Some women in this area still practice some traditional manufacturing activities such as making *puñuj*, clay pots. This knowledge is almost lost in the rest of the regions within the Reserve.

The third area includes the settlements of Chaco Brasil, Copachuncho and Maniquicito along old courses of the Maniqui river. This area is the northeasternmost frontier of the Chimane ethnic territory. Access to this area from San Borja is by boat, or on foot from the road. There is a mestizo settlement on the Maniqui Viejo, near Chaco Brasil, called El Remanso.

El Remanso was founded in the early 1960s by people from Santa Ana de Yacuma. They had originally arrived in the area to obtain animal skins such as caimans, peccaries and river otters, and live animals like parrots and monkeys for the international trade. Many people stayed to cultivate the land, and still maintain links with Santa Ana. The Chimane who live in this area arrived at the same time as the mestizos. Some worked in the extraction of the abundant animal resources for people of El Remanso, and some cultivated agricultural plots to feed this mestizo population.

The Chimane in this area practice mainly subsistence and some commercial agriculture. The main form of exchange is through barter, usually on unfavorable terms for the Chimane.

The fourth area includes a string of dispersed extended household clusters along the Curiraba river. One of them is called *Maraca* by the Chimane, or 08 by El Porvenir personnel. The Chimane who live in this area are linked to neighboring ranches in patron-client relationships, and they often work as guides for the personnel of the Reserve as well. Itinerant traders seldom visit these households; therefore, the Chimane trade their production with neighboring ranches. Because of the links of these population with Reserve personnel, this area was designated as the "cultural stable zone" in the initial Biosphere Reserve zoning for the management plan.

Finally, there is a fifth area located between the road and the Upper Curiraba river along the boundary of the Reserve. Tierra Santa and Los Manguitos (La Curva) are the Chimane settlements in this area which are linked to a ranch cooperatively owned by absentee highlander miners. Here, the Chimane have little land left and usually work agricultural fields for their mestizo neighbors. In exchange for trade goods they often hunt game animals, harvest honey and identify places where mahogany is available.

In addition to these settlements there are also a few dispersed households that are either linked to cattle ranches or prefer to be isolated because of conflicts with other Chimane or mestizo individuals.

The following sections describe the settlements which were selected from three different areas for an in-depth

comparative study on resource use and market involvement: Puerto Méndez, Chaco Brasil and Chacal.

Puerto Méndez

This Chimane settlement is located next to the Maniqui River, some eight kilometers away from the town of San Borja on the southern border of the Reserve. At the time of my first visit to this settlement in November 1988, there were 20 households, or four extended household clusters, living on both margins of the river. The total number of individuals was 101 (see fig. 3.3). The population pyramid has a broad base which indicates the predominance of young people in this settlement. By April of 1989, most of the households who lived on the left margin of the river had moved to nelocations downstream for various reasons. One important reason was that river flooding had damaged their crops. Consequently, they did not have much food to eat and there was not much land left to cultivate. They had to move to a location where land availability for agriculture was not a constraint. Although they were not living in Puerto Méndez during most of the dry season, they occasionally went back to visit the ones who stayed and to harvest produce from their fallows.

The Chimane from Puerto Méndez, with the help from an Evangelical missionary, had been claiming property rights in the area they occupied for many years, but had obtained usufruct right for an area of only 86.68 hectares in 1988.

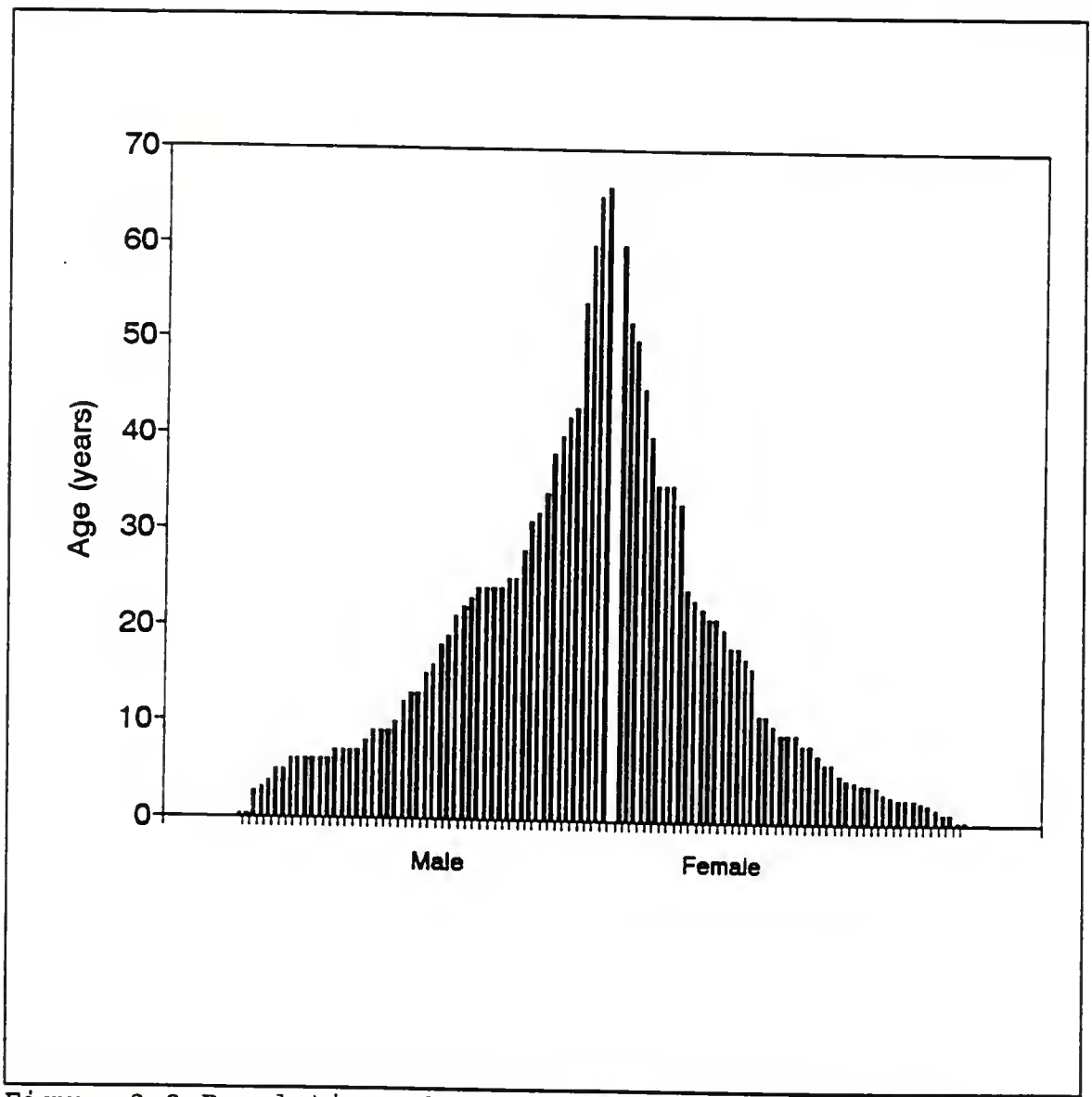

Figure 3.3 Population of Puerto Méndez by Sex and Age.

This small area included the peninsula on the right margin of the Maniqui River where some 14 Chimane households (or two extended household clusters) were located. The Chimane households on the left river margin did not benefit from this. However, some of their agricultural plots located on the right river margin were protected, and they also made use of the forest within the Reserve for hunting, fishing and gathering.

The area surrounding Puerto Méndez is occupied by *mestizo* peasants who usually have another residence in San Borja. Many of these peasants cultivate cash crops and use Chimane labor for most of the agricultural activities, from field clearing to harvesting. There is not much new land left to cultivate or establish new residences around Puerto Méndez. This is another reason why many of the residents of Puerto Méndez seasonally reside in other settlements within their ethnic territory.

Chaco Brasil

Chaco Brasil is located two days downstream from San Borja by dugout canoe, the most common Chimane means of transportation. Chaco Brasil is next to an old course of the Maniqui River called Maniqui Viejo, whose waterways are still connected to one another.

There is only one extended household cluster in Chaco Brasil which includes five households with thirty-four individuals in all (see fig. 3.4). The population pyramid illustrates the predominance of females in this settlement.

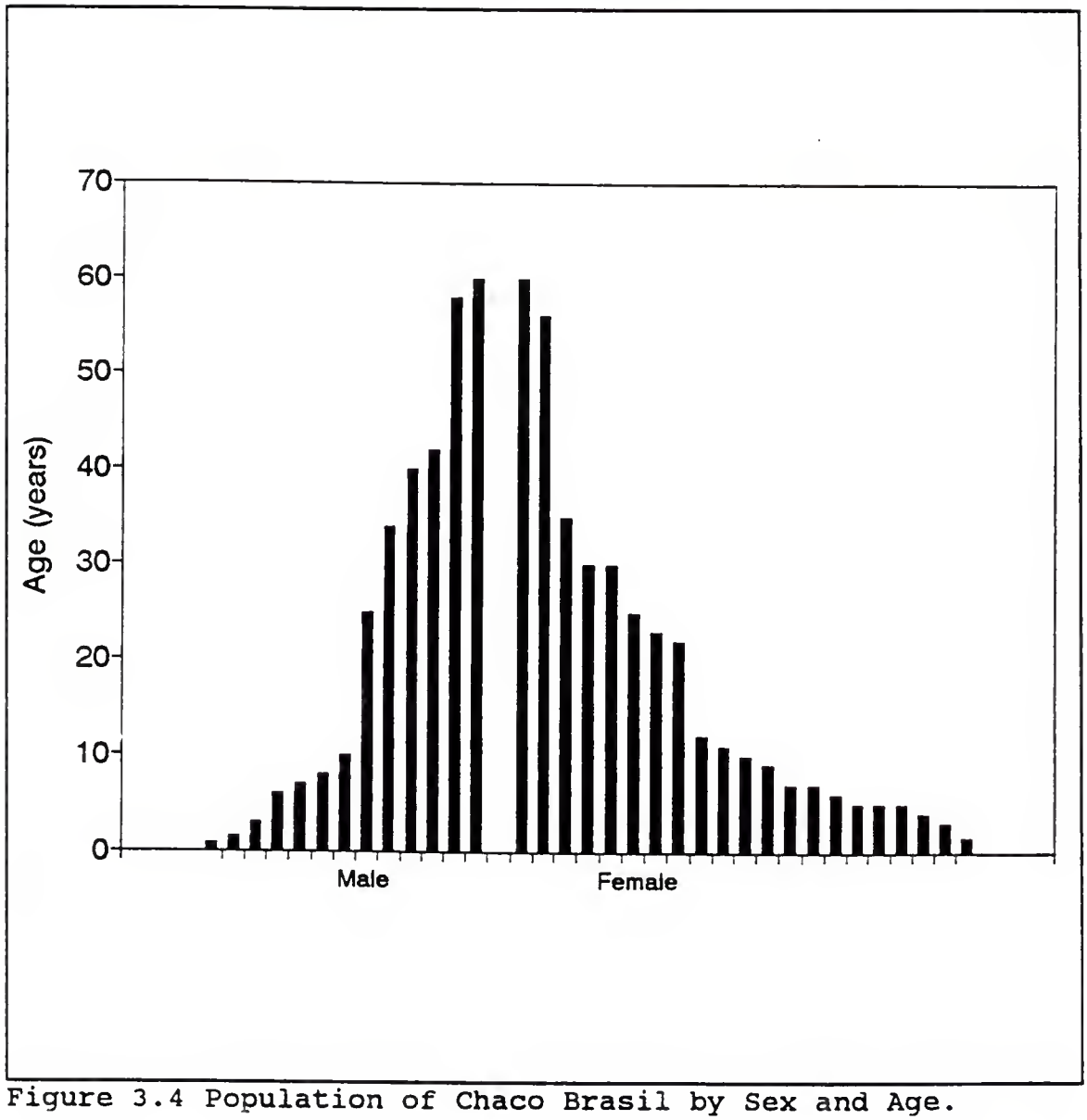

Figure 3.4 Population of Chaco Brasil by Sex and Age.

The older members of these households arrived in the area in the early 1960s to work with patrons in the extraction of animal resources for the market. These Chimane originally come from the area of Chimanes river, a tributary of the Maniqui and where the Fátima Mission is located. There are a couple of Yuracaré-Chimane (inter-ethnic marriage) households nearby (about half an hour by canoe), and other dispersed Chimane households that are related to the families from Chaco Brasil. They visit one another often, especially for an occasional *fiesta*.

The relationship with the mestizo population of the area is one of conflict. A few months before I arrived in this settlement a Chimane youth had killed a mestizo man who had repeatedly abused the Chimane's family. This mestizo's family, with others, raided the Chimane settlement in retaliation, leaving a wounded Chimane girl, and stealing domestic animals and agricultural produce (see Diez Astete 1988b). This situation of conflict remained latent, and influenced the relationships the Chimane maintained with their non-Chimane neighbors. Some Chimane households left the area after the conflict, moving deeper into the Reserve. This relationship was primarily submissive on the part of the Chimane given the threat of firearms that the mestizos owned. In this way, much of Chimane agricultural production was turned over to the non-Chimane on unfavorable terms.

Chacal

The Chimane from Chacal had been there only for about six years in 1989. There were two extended household clusters in this settlement (approximately 65 individuals), one on each side of the Maniqui river (see fig. 3.4.). The pyramid illustrates a balanced number of males and females.

This settlement is located a day downstream by canoe from San Borja. As in the case of Chaco Brasil, the older Chimane from these clusters had come to the area when they were young to work for mestizo patrons in ranches. Once one of the most influential patrons died, they decided to break the links with the ranch, and founded an independent settlement in the vicinity of the ranch where they used to live.

The particular location of this settlement was favorable for extensive use of resources in the forest within the Reserve and in the nearby savanna. At the time of my visit there was only one mestizo household living next to this Chimane settlement. This individual reported that he used to work in construction work in ranches and had decided to become independent from patrons by beginning to work in agriculture. He decided to move close to the Chimane because at the beginning he did not know how to use resources to survive (carry out agricultural labor, hunt. fish or gather), and by

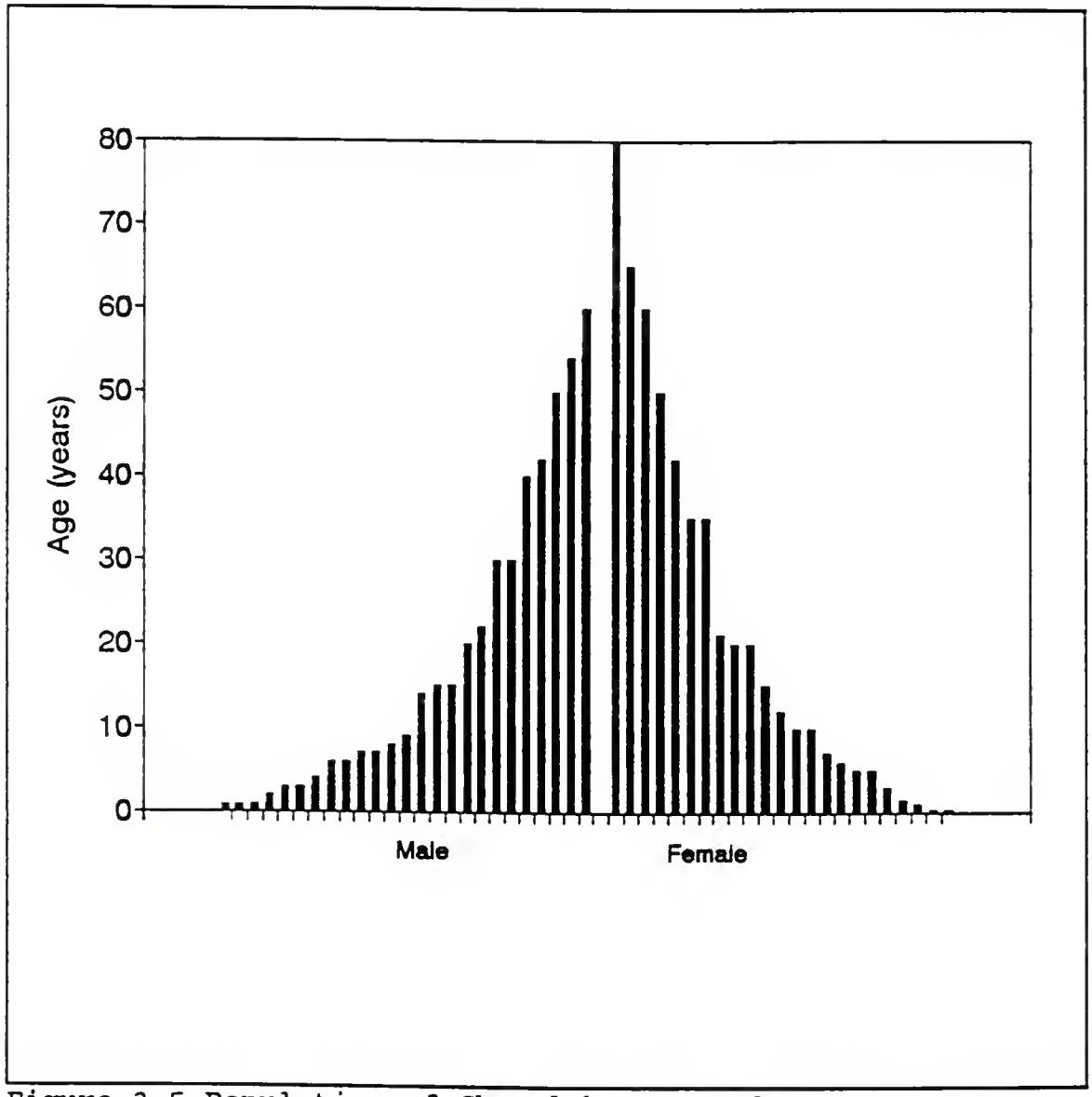

Figure 3.5 Population of Chacal by Sex and Age.

living next to the Chimane he could secure sources of food for himself and his family. The Chimane regarded him as a reliable person although they always considered him an outsider. Because this man did not know how to hunt, he often bought ammunition to give to the Chimane in order to ask them to hunt for him. The Chimane would give him part of the hunt and keep the rest for themselves. In sum, it seemed that this mestizo family benefitted more from the Chimane than they from him, although he sometimes offered the Chimane some protection from unscrupulous itinerant traders.

Discussion and Conclusions

The natural environment conditions Chimane use of natural resources. Although the Chimane have mainly lived off forest resources in the Upper Maniqui region, they also have learned to use resources from the savanna environment. The Chimane have developed social and cultural practices that protect them from sudden climate changes and some natural disasters such as flooding.

Puerto Méndez, for instance, was greatly affected by flooding in 1989. The water eroded the river banks, razed agricultural fields and reached Chimane homes. The Chimane do not usually possess anything that cannot be replaced; moreover, they are well prepared to avoid losing the things they own. Most of their belongings are either stored on a loft in their homes, or in bags that are suspended from the

transversal poles that are part of the structure of the house. Typically, houses are built on slight elevations. If confronted with inundation, the Chimane remedy the situation by collecting dry soil from other locations, transporting it with a wheelbarrow (when available), and molding this new dry soil upon the wet one. In times of flooding or other natural disasters, members of different Chimane households mobilize to help each other rebuild their dwellings.

Although there is some regional variation, there are particular elements that characterize the Chimane as a whole, such as language, a common history, similar patterns of subsistence and common cultural elements that are manifest in their social organization, behavior and belief.

Approximately 16% of the Chimane population live in the Beni Biosphere Reserve. This population represents over half of the total population of the Reserve which consists of Chimane individuals, mestizo peasants and ranch personnel. The Reserve lies in the northeasternmost part of the Chimane ethnic territory.

Cultural beliefs influence but do not determine patterns of subsistence. It has been argued that among other lowland South American groups (cf. Ross 1978) the practice of food taboos may be a cultural element that regulates the consumption of certain animal species. This would avoid the endangering (and enhance conservation) of some species. In the case of the Chimane, food taboos are part of a normative

behavior that is not necessarily followed all the time. In case of transgressing a norm, the Chimane involved would usually rationalize their behavior in a way that justifies their actions.

It is only in recent years that the Chimane are developing a regional political organization in response to outside pressures that have threatened to take their land away from them. This has helped re-evaluate and strengthen their Chimane identity.

The Chimane have been considered nomads by outsiders. In the past, and in some instances today, this justified the lack of clear regulations to title Chimane land by asserting that the Chimane would be given land that they would later abandon. In fact, Chimane subsistence patterns are based on the extensive use of natural resources which avoid applying pressure on one particular area for a long time. A Chimane extended household cluster would have two or three different residences that they would occupy at different times of the year according to the availability of distinct forest, agricultural, and water resources. However, this scenario is changing because of the gradual concentration of large Chimane settlements due to missionization efforts, the establishment of schools, and the increasing integration of the Chimane into the market economy. It is becoming harder for the Chimane to maintain different residences because there are more people surrounding their settlements within their ethnic territory.

Furthermore, in many areas it is no longer possible to carry out some practices (like moving upon the death of a relative) which gave them access to new resources.

Conflictive relationships with the mestizo population are prevalent. Although the Chimane are considered lazy and almost sub-human by the mestizo population, the latter usually take advantage of the Chimane by appropriating much of the Chimane agricultural production and labor force through unequal exchange relationships and force.

The Beni Biosphere Reserve may be considered an "island" for purposes of conservation. The study of Chimane resource use is particularly important to assess the limits and potential for conservation of natural resources and development of an indigenous group.

One conservation implication of the geographical isolation of the Reserve points to the recuperation potential of the animal populations affected by activities such as hunting. Although there are a few specific studies that document the number of individuals per animal species in the Reserve, it is believed that given the low animal densities observed in the Reserve, sustained hunting may cause the local extinction of some animal species (Miranda et al. 1989: 261). For instance, according to local people's reports, peccaries were once more common in the Reserve, but because of intensive commercial hunting in the 1960s and 1970s, it has become a relatively rare species in the Reserve.

The study of Chimane hunting can therefore improve our understanding of the conservation potential of animal species in the Reserve. Chimane hunting behavior may be sustainable under particular conditions of extensive land use but may not hold as well in an "island" situation.

CHAPTER 4
EXTRACTIVE SUBSISTENCE ACTIVITIES I
HUNTING

Introduction

This chapter examines the ways in which the Chimane use faunal resources, specifically by means of hunting. The focus is on three Chimane settlements in the Beni Biosphere Reserve. The analysis centers on a comparison among settlements, and when necessary the analysis will be extended to the household level. In general, the household is the unit of production but consumption usually takes place at the extended household cluster level.

I have chosen three extended household clusters for further analysis. One in Puerto Méndez (consisting of six households), another in Chaco Brasil (five households), and a third one in Chacal (seven households). At the time of my research there were four extended household clusters in the wet season and two in the dry season in Puerto Méndez. In Chaco Brasil there was only one extended household cluster year round while there were two in Chacal. These settlements were chosen for further study after I carried out a survey from October through December 1988 among Chimane settlements in the Reserve.

This chapter examines Chimane hunting as it relates to the location of their settlements and resource availability. Recent studies on hunting efficiency and social change have postulated that when native groups undergo circumscription and become more sedentary, these native groups intensify use of local resources which then results in degraded habitats. Given this situation, indigenous groups need to develop new strategies to meet their subsistence needs (Gross et al 1979). In the case of the Yanomami who lived next to a highway, this new strategy involved the intensification of the traditional but rarely practiced collective hunting technique. According to Saffirio and Scaglion:

> They (*the Yanomami*) must go deep into the forest in order to find game; during these hunts they also gather wild food. This strategy has resulted in higher total yields from hunting, yet the overall effects of such a modified subsistence strategy must also be considered. (Saffirio and Scaglion 1982: 325)

Social and ecological factors are examined to assess the limitations and potentials of Chimane answers to new social conditions. Additionally, I assess the possibility of conservation of natural resources in the Reserve by examining Chimane harvest rates.

Hunting is a significant activity for the Chimane not only in terms of food procurement but also in the context of the cultural practices that surround it. There is an important interplay of socio-cultural and economic factors regarding this activity.

The Cultural Context

The Chimane have a fine-tuned knowledge of riverine and forest resources. They have also learned to make use of other resources near the boundaries of their territory in the Beni savanna. The savanna is an area where the Chimane actively seek animals such as armadillos. In the savanna there are also forest islands with small populations of primates. The Chimane often make trips to these areas where the food supply is relatively abundant, especially during the dry season.

For the Chimane, most animals are edible (see Appendix A). There are only a few which are interdicted at particular times during a person's life cycle, such as pregnancy. Some of the few undesirable animals include snakes, sloths, bats, rats, vultures, and oppossums (particularly *ajshaca*, Philander opossum). Among the reasons reported for the inedible quality of undesirable animals was that they were poisonous, inactive, too small, or that they had a fetid smell. The question of the concept of "bad scent" among the Chimane has been previously explored by other researchers (cf. Pérez Diez 1985). The Chimane concept of bad scent differs from that of other non-indigenous people from the Beni region. For instance, most non-indigenous people consider that capybaras (Hydrochaeris hydrochaeris) have a strong fetid scent or fishy taste and, therefore, they will never eat them. The Chimane, on the other

hand, are fond of eating capybara, although they would not readily admit it in front of people outside their culture. If they hunt a capybara, they would conceal the harvest from their non-indigenous neighbors to avoid censure. It should also be noted that when there is lack of preferred animals, some Chimane would eat even those animals that are, in principle, considered inedible, such a opossums and sloths.

Some of the most prestigious/desirable prey to obtain include peccaries (Tayassu tajacu, T. pecari), tapirs (Tapirus terrestris), deer (Mazama americana, M. gouazoubira, Blastoceros dichotomus), and spider monkeys (Ateles paniscus). Among these prey, only peccaries were hunted in all three settlements during the time in which I recorded hunting yields. While visiting Chacal in November 1988, I noticed a young tapir. I was told that its mother had been wounded and escaped, so they kept the tapir as a semi-domesticated animal. In some cases the Chimane keep the young of animals that they hunt as pets and as a "security fund" to be eaten in times of hunger. However, in many cases the pet animals escape or die before they are actually killed. In the case of the young tapir, the Chimane did not eat it because it was killed by a snake.

Hunts may be carefully planned or opportunistic. The Chimane are willing to leave anything they are doing when they spot a game animal. On one occasion, a couple of Chimane arrived in Chaco Brasil from another settlement while many

people were working in their agricultural fields. The visitors said that one of them had wounded a tapir the night before and they thought it was probably in the vicinity of this settlement. Two men from Chaco Brasil were drawn into the expedition because they could not resist the prospect of obtaining tapir. This effort, however, was not successful.

Deer were not taken when I recorded hunting yields. On one occasion, however, while having breakfast in Chaco Brasil, we saw a deer swimming accross the Maniqui Viejo river. After it was spotted, the men picked up their bows and arrows and rushed to pursue it. A couple went upstream by canoe, while others hurried on foot with their dogs to meet the deer at the river's edge. Despite this mobilization the animal was able to escape unwounded.

The importance of hunting certain animals such as *shí* (tapir) and *ñej* (deer), is evident by the generalized beliefs that surround the hunting of these animals. Before a planned hunting trip, men should not have sexual intercourse because their ability to pursue and kill an animal would be diminished. If a hunter kills a male tapir, the hunter cannot bathe for seven days; if the prey is a female tapir, the hunter cannot bathe for nine days. Another restriction includes the taboo on eating hot peppers before hunting tapirs. One informant reported that these restrictions also applied when one hunted a harpy eagle, while another reported that when hunting a deer, whether male or female, one cannot

bathe for seven days. Pérez Diez (1983: 356) reports that these restrictions also apply to giant anteaters and jaguars (the latter are not edible because they are thought to be people).

It is noteworthy that the restrictions on tapir hunting also apply when a Chimane male or female relative dies. A possible explanation is that all the animals mentioned above are said to have been Chimane in mythical times. They are thought to have been people that used to eat other people. Pérez Diez (1983) further asserts that *jäjäbä* (general term for the "owner of the animals"), can take the form of a tapir in the forest. Because the Chimane have a great respect and fear of *jäjäbä* who is able to cast evil spells, it is possible that the restrictions are applied to avoid harm from this force.

In other Chimane areas, the Chimane who hunt tapir or deer cover their faces with *quí* (Genipa americana), and a substance called *faj*,[1] which is probably taken from an animal's pancreas; sometimes this substance is applied on the hunter's face mixed in with *isatrij* (Daillant, pers. comm.).[2] The purpose of this action could be to hide the identity of the hunter so as not to infuriate the "owner of the animal".

Cujij is thought to be the "guardian" of birds and their eggs. He is thought to have dogs that help him take care of

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[1] The same term is used for Bixa orellana.

[2] Ethnologist, University of Paris, France.

the birds, these dogs are believed to actually be *itsiki'* (jaguars). Cujij's body is supposed to be of stone, therefore, he is very strong. In the past, anyone who would pick up the eggs cujij took care of would die because he used to set a trap made of steel that would kill anyone who attempted to "steal" eggs. Since a Chimane was able to fool cujij by taking the eggs without falling in the trap, the Chimane are able to take eggs too, but only with moderation.

The Chimane believe that there is *piñidye'*, roughly translated as "medicine", that can enhance the hunting abilities of those who take it. The Chimane also use piñidye' for their dogs. One such medicine is a substance that combines *isatrij* (amber) with *tsinki'*, which is the juice in the gallbladder of either harpy eagle, spider or cebus monkey. Isatrij is unavailable in the area of the Reserve. One Chimane traveled to the Eva-Eva area at the Western boundary of the Chimane territory to obtain isatrij. He exchanged five rifle bullets with a fellow Chimane for twenty pieces of isatrij to bring back home to the Reserve. This Chimane said that isatrij was very abundant in that area and the Chimane who live there used it as ornaments in necklaces and as medicine to become <u>más punteros</u>, better hunters. Isatrij is ground with a knife and mixed with the *tsinki'* of an animal, preferably a harpy eagle or a spider monkey. The mixture is then applied in the eyes of the hunter. Once it is well rubbed in, the hunter uses a harpy eagle claw to scarify his arms in the belief that this

would help him be as good a hunter as an eagle. The hunter cannot bathe for seven days, then he can bathe once and not bathe for another seven days. The Chimane believe that this process cannot be interrupted lest the hunter become inept. It is also recommended that the hunter periodically drink manioc beer mixed with isatrij to strengthen the power of the piñidye'.

Many Chimane households engage in certain practices believed to enhance access to game animals. The most common practice is cutting off the feet of the prey, especially those which "run" fast, namely, collared peccaries, white-lipped peccaries, coatimundi (Nasua nasua), agoutis (Dasyprocta sp.), and pacas (Agouti paca). The Chimane tie up the feet and bury them in the belief that this would lessen the likelihood that the prey will run away from the hunter the next time. Sometimes the heart of the animal is also tied to the feet. Some Chimane tie the skull of a paca to a piece of balsa wood and throw it into the water, in the belief that if a hunter encounters a paca it will not disappear into the water so he will be able to kill it.

Some Chimane leave the heads of the prey, especially white-lipped peccaries, at the kill site. They claim they do this because the heads are too heavy to carry to their settlements. Others maintain that they cut off and bury the heads at the kill site to hide them from the mythological "owner". The sight of dead animals is supposed to infuriate

caya'dij who is the owner of *mumujñi*, the white-lipped peccaries. Some Chimane believe that if they bury the peccary heads at the kill site, the other peccaries will remain in the area and can therefore be hunted at a later date. Leaving the heads will thus ensure the availability of these animals to the Chimane.[3] One Chimane also said that after the white-lipped peccary bones are collected from those who consumed them, they are buried near a *shíbo'*, or chonta palm (Astrocaryum sp.), a preferred food for these peccaries. All Chimane affirmed that it is very important to keep *caya'dij* pleased so he will not hold back his peccaries from the Chimane. Rites in the *shipa* (Chimane cult house) focus on ensuring the availability of animals and fish, especially peccaries (Daillant, pers. comm.).

In some settlements I noticed that some Chimane kept animal skulls, especially those of tapir, deer, and some species of monkeys. They believe that by keeping the skulls, they enhance the reproduction and availability of these game species. Some households still practice the tradition of collecting the bones of the animals they hunt in a basket or in the crevices of their homes' ceiling thatch. Additionally, if a hunter offers the product of his hunt to relatives

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[3] Isabelle Daillant (pers. comm.) reported that in the area where she worked, some Chimane brought white-lipped peccaries with heads but with their ears cut off. It is possible that the Chimane buried only the ears to ensure availability of peccaries but consumed the peccary heads at their settlement.

outside his household, he expects them to return the bones of the animal to him. This practice is especially enforced in traditional Chimane areas. The Chimane bury all these bones together at a later date. This action is supposed to enhance the reproduction of game species. Collared peccary bones are buried in a burrow, white-lipped peccary bones near a chonta palm (Astrocaryum sp.), and the bones of other animals near one's home.

Research Methods

In order to assess the amount of game and fish taken by the Chimane in the Beni Biosphere Reserve I recorded the procurement of game animals and fish for 150 days among three extended household clusters in three different settlements in 1989. For every hunting trip that took place I recorded the name of the informant, the date, duration of the hunting trip, and whether the hunter went alone or with others. The number and names of those who accompanied the hunter, the kind of weapon used, place and distance traveled to where the hunt took place, and the type of weather were also recorded. For each game animal hunted, I recorded its sex, development stage, and weight. I also recorded the name of the person who cleaned and processed the game, and how it was distributed and consumed within and outside the household.

I considered recruiting Chimane to help me record hunting and fishing yields while I was away in another settlement. However, this proved impossible because there were only a few

semi-literate Chimane and the task required skills that they did not command. Instead, I recorded hunting yields during the rainy season in Puerto Méndez (January-February), and in Chaco Brasil (March-April) for 30 consecutive days in each settlement. Hunting yields were also recorded during the dry season in Chaco Brasil (June-July), in Puerto Méndez (July-August), and in Chacal (September-October). Thirty consecutive days were recorded in each case.

The study population in Puerto Méndez consisted of 43 people, five of them frequent and one occasional hunter (men). In Chaco Brasil, the study population consisted of 34 people, five of them were frequent hunters (men), and two occasional hunters (one of them a woman). In Chacal there were 40 people in the study population, six of them regular hunters (men). In most cases the hunters were male heads of households. The occasional hunters were sons of the heads of household and in one case a female head of household. In sum, there was a total of 16 frequent, and 3 occasional hunters in the three settlements during the research period.

Technology

Traditionally, the Chimane have used bows (*coi'dye'*) and arrows to obtain game. Men manufacture bows and four different types of arrows, each with a particular purpose. Bows and barbed arrow points are made from the wood of *väij* (Bactris sp.), a cultivated palm often found in fallows. Full size bows measure around 170 centimeters, and barbed point arrows around

150 centimeters; the Chimane also make smaller sets of bows and arrows for their children to practice hunting. Bowstrings are made of the bark of Cecropia sp. which are skillfully and tightly twined in order to resist prolongued use.

Arrow shafts are made from cultivated *shuru'* (Gynerium saggitatum). *Ijme* arrows have barbed points and feathers on the shaft and are used to hunt small animals. Arrows with barbed points and without feathers, or *yajsi*, are used for fishing. *Comora* is another type of arrow with a blunt point made out of wood which is used to hunt small birds. These arrows measure around 130 cms. The fourth type of arrow, *ton'*, is longer measuring around 170 centimeters and is used to hunt large animals. The lanceolate point is made of a type of cultivated bamboo that is well sharpened around the edges; there is a piece of *väij* (palm wood) connecting the point with the actual shaft in order to make the arrow more stable. *Ton'* are used to hunt large animals and birds such as tapir, peccaries and curassows.

The Chimane emphasize the importance of placing feathers in the right position, a palm width from the shaft's blunt end.[4] Feathers are spiralled to provide spin to the arrow. This is supposed to give the right direction and velocity to reach a target. The Chimane use *puñipu'*, a red sticky bar made

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[4] Nordenskiöld (1924) pointed out that the position of the feathers in arrows made by Chimane were particular to this culture.

of a cooked mixture of the resin of *mu'suru*[5] with *faj* (Bixa orellana), to place the feathers and to affix the arrow points to the shaft. The feathers and the points are further secured in place with a thin but sturdy cotton thread. The Chimane prefer to use the feathers of *emej* (Penelope jacquacu), *tobí* (Pipile pipile), and *opaj* (Crax globulosa), but they will use any others when these species are unavailable.

Bows and arrows are still used in all three settlements where hunting yields were recorded. There were, however, some significant differences (chi-square= 19.78522; sig.= 0.0314) in the frequency of use to acquire game (see table 4.1). Arrows were used in 50% and 47% of the hunts that took place in Chaco Brasil and Chacal respectively, while they were only used in 19% of the hunts in Puerto Méndez.

Among the households studied in Puerto Méndez, there were two men who owned firearms. One had a rifle and a shotgun, and the other just a shotgun. These arms were usually lent to any relative who wanted to go hunting, under the implied condition that they would share a significant portion of the prey acquired with the owner of the firearm. Likewise, if the owner of the firearm used ammunition provided by someone else, the owner of the ammunition would receive a significant part of the prey.

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[5] In Spanish "chicle de monte"; probably Brosimum sp. or Manilkara zapota (Lara 1988: 235).

TABLE 4.1
WEAPONS USED IN HUNTING
BY SETTLEMENT, 1989
(in percent)

WEAPON	P. MENDEZ (n=26)	CHACO BRASIL (n=36)	CHACAL (n=15)
Arrows	19.2	50.0	46.7
Firearms	50.0	16.7	53.3
Machete	26.9	25.0	0
Shovel	0	2.7	0
Hands	0	5.6	0
Dogs	3.9	0	0
TOTAL	100.0	100.0	100.0

chi-square= 19.78522 D.F.= 10 sig.= 0.0314

In Chaco Brasil, only 16.7% of the hunts were carried out with firearms. Nobody owned a firearm in Chaco Brasil, but they were able to borrow a firearm from Chimane who lived in other settlements, and from non-indigenous neighbors. Firearms were used in 53% of the hunts in Chacal and Puerto Méndez. Five men in Chacal owned firearms while only two did in Puerto Méndez. In every case the limitation for the use of firearms was the availability of ammunition. There was a conscious effort to save ammunition for prey that would offer high yields. The three common types of firearms in the region are .22 rifles, and 16 and 20 gauge shotguns.

Generally, the Chimane have obtained their firearms by barter. One Chimane reported that he exchanged 40 arrobas of rice for a 20 gauge shotgun (a value of ca. US$ 67.00). Another one reported having had to work for three months at a ranch to obtain a rifle (ca. US$ 125.00).

A machete is a multifunctional tool used not only for agricultural work and weeding but also for construction, opening trails, and the acquisition of food. Machetes are used in hunting when the prey is an animal who lives in a burrow or when it has been cornered with the help of dogs. Many of the opportunistic hunts were carried out with a machete while the hunter was working in his agricultural field (27% of the hunts in Puerto Méndez, 25% in Chaco Brasil). In one case a shovel was used in Chaco Brasil to kill a giant armadillo that a dog had discovered near an agricultural fallow.

Although other authors (cf. Nordenskiöld 1924; Pérez Diez 1983) have reported the use of traps to obtain game, I did not observe the common use of traps. I only saw one type of trap during fieldwork. The trap had been built by a Chimane and a peasant in order to capture a jaguar. This trap had the form of a large box with bait inside; this was intended to capture a live animal.

Another method of hunting includes the use of platforms. When pursuing game in the forest, some Chimane build a platform near a salt lick, or a fruiting tree. The hunter waits on the platform for animals to come to lick the salt or feed themselves to capture them.

While some dogs are kept as house-guardians, others are often taken into the forest to be trained as hunters. Dogs are especially important in locating animals that live in burrows such as armadillos, and to corner animals that have been wounded. Women virtually never use a bow and arrow to hunt, but they sometimes hunt with the help of dogs, and can kill an animal with a machete. Tortoises are picked up in the forest without weapons.

Dogs that have helped in hunting an animal are given the prey's small intestines to eat right after the game animal is gutted. Hunting dogs are also given the bones of the animal they have hunted. The Chimane are careful not to give a dog that has not participated in the hunt any part of the game animal that another dog helped to hunt. It is believed that

the ability of a hunting dog will diminish if another dog eats his prey. Often the Chimane gut their game animals at the site where they are caught. Sometimes the hunter will smear the blood and/or stomach contents of the game animal on a dog that is being trained to hunt. This will presumably make the dog a better hunter.[6]

There are different stages of pursuing game in the forest. A hunter normally follows a trail until he finds fresh tracks; hears an animal feeding, or moving; or smells the prey, as in the case of peccaries. When following one or more of these cues, the hunter tries not to scare away the prey, although this is difficult if he is hunting with dogs. Dogs and other hunters are particularly helpful when cornering an animal. If an animal tries to escape by entering a burrow, the hunters stops it by blocking the entrance. This is done by placing wood poles vertically and leaving a space between them in order to shoot arrows into the burrow to kill the animal.

Flashlights are very uncommon among the Chimane, consequently, they rarely hunt at nights; unless there is moonlight. When on a long hunt in the forest that requires to

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[6] Additionally, Pérez Diez (1983: 345) notes that some hunting dogs are given the gallbladder of paca (Agouti paca) to eat in order to make them better hunters. I have not been able to document this. However, in the Beni some non-indigenous people use paca gallbladder juice to cure stomach ulcers. Because bile is bitter, they usually mix it in with manioc starch to make "pills". Some people believe that these pills are also good against snake bites. Some Chimane occassionally sell paca gallbladers to non-Chimane for this purpose.

be away from home for a few days, the Chimane are active pursuing prey during the day but when the night falls, they use time to set up camp: the pascana.

Type of game obtained

Peccaries accounted for most of the game obtained, in weight and number, during the research period. This taxon represented almost one fourth of the total number of individual game animals obtained. Second in importance were rodents (17.7%), then primates (16.7%) and edentates (16.7%), while the general category of birds consisted of 11.7% of the total number of individual game species obtained. Coatis (7.1%) and tortoises (6.2%) appeared to be the least important for the Chimane (see table 4.2). Small birds may have been under-reported as they are usually hunted by children who are practicing their aim.

Birds were identified with a field manual (Hilty and Brown 1986). These included: Accipiter superciliosus, Chavana torquata, Ardea cocoi, Nyctalus radiatus, Ciconia maguari, Columba subvinacea, Ortalis guttata, Lamprosar tanagrineus, Tinamus major, Trogon melanurus, and a few others that were not possible to identify accurately.

There were important differences among the three settlements studied in terms of the kind of game acquired during the research period. About one third of the total catch

TABLE 4.2
NUMBER AND TYPE OF GAME SPECIES TAKEN BY SETTLEMENT DURING RESEARCH PERIOD

	Puerto Méndez	Chaco Brasil	Chacal	Total (n=113)
Primates				
Saimiri boliviensis	0	7	0	7
Cebus apella	1	3	0	4
Alouatta sp.	1	2	1	4
Aotus sp.	0	0	4	4
Total	2 (6.2%)	12 (24%)	5 (16.7%)	19 (16.7%)
Rodents				
Agouti paca	2	5	0	7
Dasyprocta sp.	7	0	0	7
Hydrochaeris hydrochaeris	1	1	2	4
Sciurus sp.	1	1	0	2
Total	11 (34.4%)	7 (14%)	2 (6.7%)	20 (17.7%)
Edendata				
Tamandua tamandua	1	6	0	7
Dasypus novemcinctus	4	2	5	11
Priodontes maximus	0	1	0	1
Total	5 (15.6%)	9 (16%)	5 (16.7%)	19 (16.7%)
Artiodactyla				
Tayassu tajacu	5	2	0	7
T. pecari	0	3	17	20
Total	5 (15.6%)	5 (10%)	17 (56.7%)	27 (23.9%)
Carnivora				
Nasua nasua	3 (9.4%)	5 (10%)	0	8 (7.1%)
Reptile				
Geochelone carbonaria	0	6 (12%)	1 (3.3%)	7 (6.2%)
Birds	6 (18.8%)	7 (14%)	0	13 (11.7%)
	(100%)	(100%)	(100.1%)	(100%)

in Puerto Méndez was rodents (especially agoutis) compared to only 14% and 6.7% for Chaco Brasil and Chacal, respectively. In Chaco Brasil, one fourth of the total catch was primates, particularly squirrel monkeys, a higher proportion than in the other communities. Over half of the total catch in Chacal was white-lipped peccaries, and only 6.7% were capybaras which are large riverine rodents.

These results stem from the distinct historical and ecological conditions in each settlement. Puerto Méndez has been occupied continually by Chimane and other non-indigenous people for at least the past fifty years. It is located on the banks of the Maniqui river, close to the town of San Borja and a number of agricultural fields and fallows. Consequently, most of the game acquired in the vicinity of Puerto Méndez are animals which abound in secondary forest areas such as medium sized rodents.

The Chimane who live in Puerto Méndez would have to travel farther than five kilometers and probably spend the night away from their settlement in order to obtain larger prey. During the dry season some Chimane like to visit relatives in areas where desirable animal and forest resources are more abundant. Sometimes these trips can take weeks, and the yields are consumed away from the settlement. Because these trips are combined with visiting relatives, one cannot assume that the trips take place because of the scarcity of resources at home.

The catchment areas for the three communities are illustrated in figures 4.1, 4.2, and 4.3. In Puerto Méndez, the whole area included 31.36 square kilometers located around their settlement and into the Reserve. However, 90% of the hunts recorded took place in an area of 10.9 sq. kilometers around their settlement. The catchment area for the recorded hunts in Chaco Brasil was a total of 30.7 sq. km. but 90% of the hunts took place in an area of 10.5 sq. km. This area included regions near the Maniquicito river where there are some established pascanas. In Chacal, the catchment area was very ample: 90.2 sq. km. This area had a rectangular shape next to the river edges for the Chimane used canoes to travel to their hunt sites either upstream or downstream from their settlement.

In Puerto Méndez there were 32 animals killed for 43 consumers in 60 days; 51 for 34 consumers in Chaco Brasil in 60 days; and 30 animals hunted for 40 consumers in Chacal in 30 days. Harvest rates and sustainability will be discussed in a later section in this chapter.

The Chimane favor areas located near their settlement and in the forest for hunting; although, as mentioned earlier, special trips are often made to savanna areas and island forests in the savanna in order to hunt, fish, and gather. Because the Chimane are primarily agriculturalists, their settlements are usually located near preferred agricultural land.

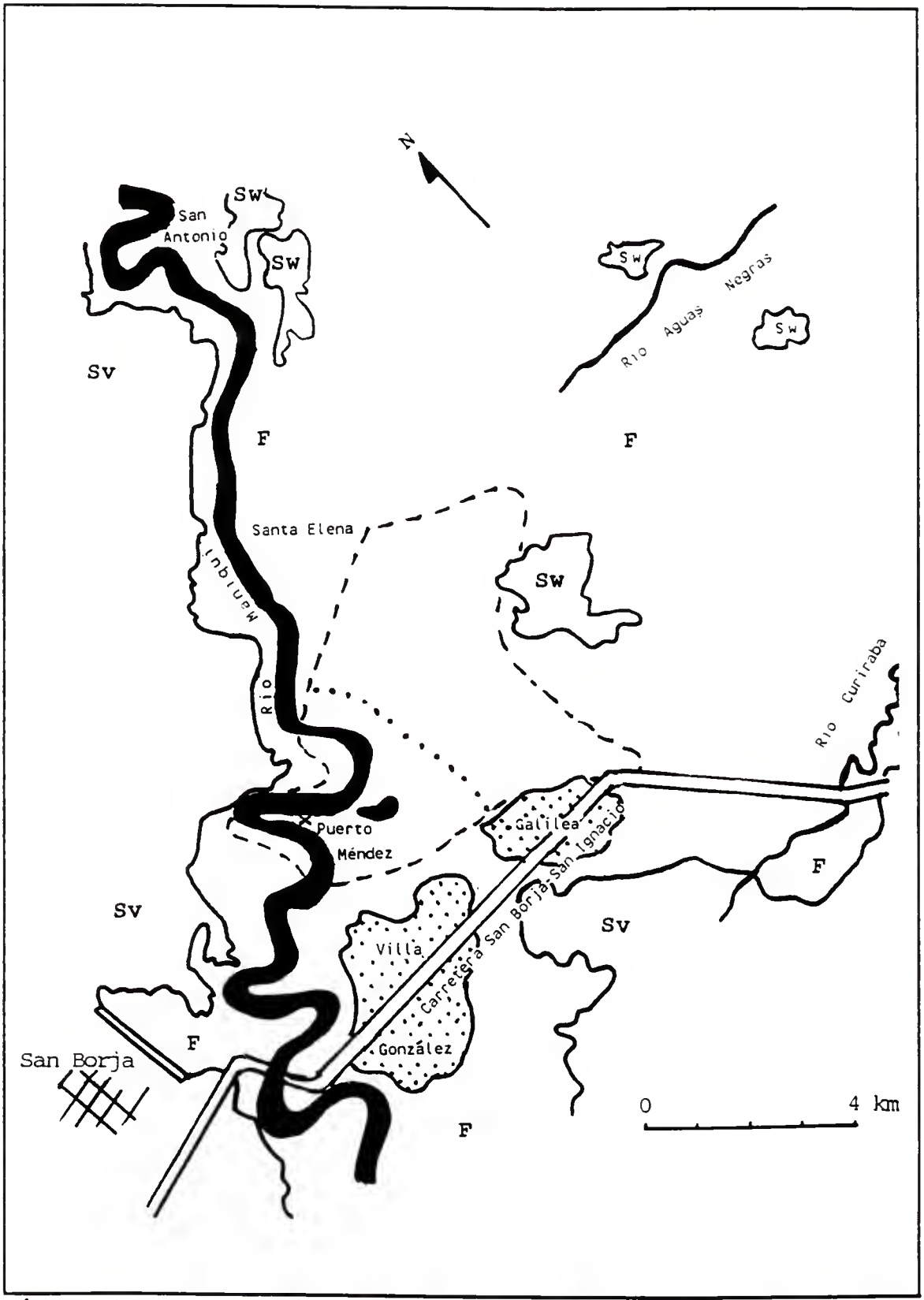

Figure 4.1 Puerto Méndez catchment area. All hunts took place inside area indicated by the dashed line; the limit of the core hunting area is indicated by the dotted line. F=forest; Sw=swamp; Sv=savanna.

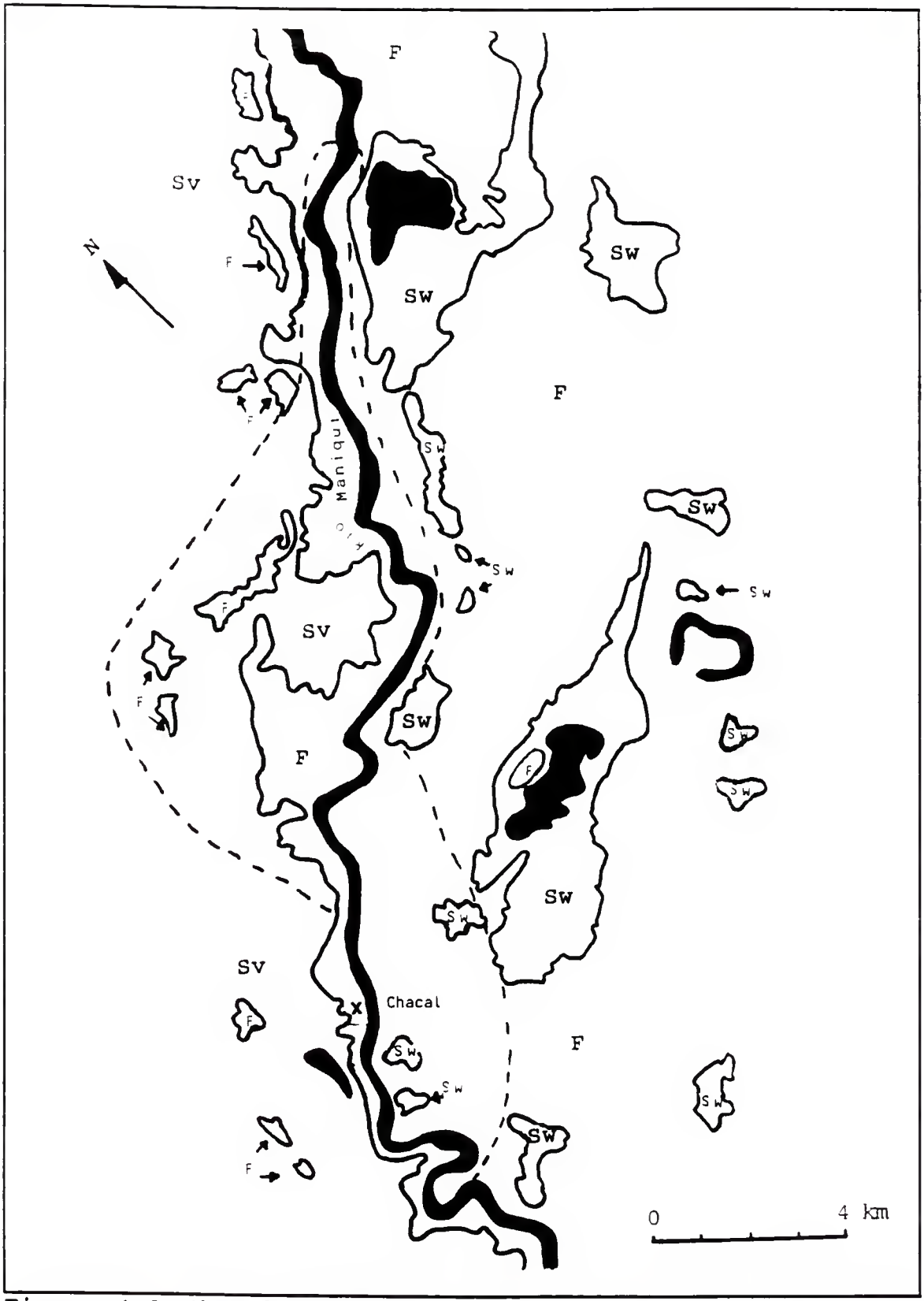

Figure 4.2 Chacal catchment area. All recorded hunts took place inside the area indicated by the dashed line. F=forest; Sw=swamp; Sv=savanna.

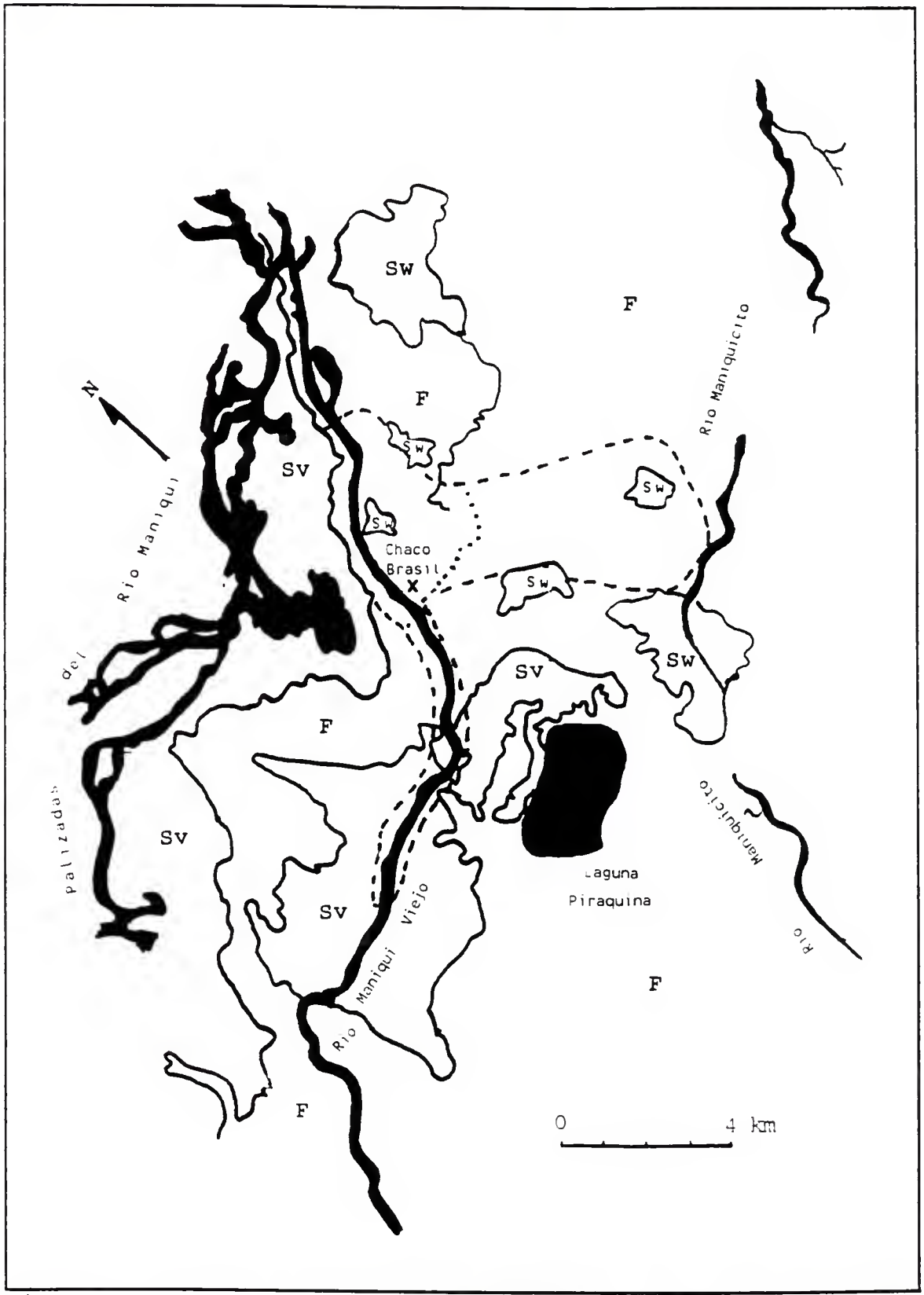

Figure 4.3 Chaco Brasil catchment area. All hunts took place inside area indicated by the dashed line; the limit of the core hunting area is indicated by the dotted line. F=forest; Sw=swamp; Sv=savanna.

Hunting sites. Table 4.3 shows the percentage of kills that took place in different sites. Overall, one fifth of the hunts took place in the forest, while one third of the hunts took place either in an agricultural field or fallow. Lake edges (18.5%) and savanna areas (14.8%) were also important hunt sites for the three communities. There are significant differences (chi-square= 64.40633; sig.= 0.0000) among the settlements in terms of the sites that they commonly visit to hunt.

In Puerto Méndez, a third of the total catch took place at lake edges and surrounding area, showing the importance as a source of animal resources. Many Chimane combine fishing and hunting activities in the vicinity of this lakes.

Chaco Brasil seems to be an intermediate case between Puerto Méndez and Chacal. Chaco Brasil was first occupied in the mid-1960s. When this settlement was founded, the main channel of the Maniqui river had not yet shifted to the north. The local Chimane report that in the early years of their occupation of the settlement, there was an abundance of spider monkeys, peccaries, caimans, and river otters. The latter two taxa are now locally extinct, most likely because of overhunting by non-indigenous people for commercial purposes. Spider monkeys are rarely seen in the area. In addition to the prevalence of pacas and anteaters in the area, collared peccaries are periodically found near Chaco Brasil. Many of

TABLE 4.3
TYPE OF KILL SITES IN PERCENT BY SETTLEMENT, 1989

KILL SITE	PUERTO MENDEZ (n=30)	CHACO BRASIL (n=36)	CHACAL (n=15)	TOTAL (n=81)
Agricultural field	10.0	11.1	0	8.6
Agricultural fallow	20.0	8.3	0	11.1
House garden fallow	13.3	16.7	0	12.3
Seasonal stream edge	0	8.3	0	3.7
Lake edge	33.3	13.9	0	18.5
River terrace	3.3	16.7	6.7	9.9
Forest	20.0	22.2	20.0	21.0
Savanna	0	2.8	73.3	14.8
TOTAL	99.9%	100.0%	100.0%	100.0%

chi-square= 64.40633, D.F.= 14, sig.= 0.0000

them are attracted to manioc fields and fallows. When fresh peccary tracks are found, and the damage to crops is evident the Chimane organize hunts to obtain this game. But Chimane have to travel deep into the forest to find white-lipped peccaries for their consumption.

Chaco Brasil now lies on the banks of the Maniqui Viejo. The Maniqui river having moved in the early 1970s. The river does not overflow during the rainy season as the Maniqui does; in fact, the water level is gradually diminishing every year. During the wet season it is dangerous to travel on the Maniqui river because of the strength of the current. Therefore, subsistence activities along the river at this time are limited in Puerto Méndez and Chacal. On the other hand, the Chimane who live in Chaco Brasil can make use of riverine resources such as fish, turtles, and other animals that congregate near the water along the Maniqui Viejo year round. Population pressure in the area of Chaco Brasil is not as high as in Puerto Méndez. Although there are some agricultural plots and fallows, there are also areas of primary forest nearby where many bands of primates can be found. It is not uncommon to hear the howling sounds made by bands of *uru'* (Alouatta sp.) early in the mornings.

Chacal is a relatively new settlement. It was formed in 1983 by Chimane who had previously worked at a ranch where their main benefactor had passed away. Once the rancher died the Chimane living and working in his ranch decided to move

away and live on their own, free of the ties to a ranch. Chacal is located at a strategic position along the banks of the Maniqui river. To the south, they have access to forest resources within the Reserve, while to the north they can utilize savanna resources. Table 4.3 shows that 73.3%, of the game obtained was acquired in savanna areas. Moreover, they live one day downstream by canoe from San Borja, close enough to town to make occasional visits but far enough from non-indigenous people that would compete with Chimane to have access to natural resources.

Hunt duration and distance. Table 4.4 shows average hunt duration by settlement. In the three settlements a hunter spent an average 7.18 hours (s.d. 7.58 hs) away from his settlement pursuing game.

However, there were significant differences (anova sig.= 0.0003) among the three settlements in terms of time spent on each hunt. This can be explained by the location of the settlement in relation to the location of preferred prey.

One important characteristic that places Chacal (average: 14.22 hs) apart from the other two communities is the number of long (overnight) hunts (*jibí*), and hunts carried out in groups. The long hunts carried out in Chacal are explained not by depletion of resources in nearby areas but in terms of socio-cultural practices. The hunting survey in Chacal was carried out for 30 days during the dry season when visiting relatives takes place.

TABLE 4.4
AVERAGE HUNT DURATION BY SETTLEMENT, 1989.

SETTLEMENT	AVERAGE TIME*	ST. DEV.	# CASES
Puerto Méndez	4.9 hs	2.97 hs	29
Chaco Brasil	6.33 hs	7.95 hs	38
Chacal	14.22 hs	9.4 hs	14
TOTAL AVERAGE	7.18 hs	7.58 hs	81

ANOVA sum of squares= 3134353.1227; D.F.= 2; F= 9.1037;
mean square= 156176.5613; sig. 0.0003

*Note: hs= hours. These averages includes one overnight hunt in Chaco Brasil, and five overnight hunts in Chacal.

In this season the Chimane went on longer hunting trips to places that were as far as 40 kilometers away from their core settlement (see table 4.5).

During the period of this study, five overnight hunts were carried out in Chacal, primarily to pursue white-lipped peccaries. White-lipped peccaries are one of the most preferred game species for the Chimane with a very important nutritional and symbolic value. Because these peccaries travel in large herds, the Chimane carefully plan long group hunts to sites, such as salt-licks and mud baths, where they are likely to find white-lipped peccaries.

I did not register a single long hunt in Puerto Méndez, although it might be expected in an area where preferred faunal resources had diminished. This is because the Chimane had changed their focus from pursuing larger mammals to pursuing animals which are common in secondary forests. The Chimane also had access to meat that could be obtained in the market because Puerto Méndez is located near San Borja. It should be noted, though, that the type of meat occasionally obtained from such markets was low quality such as offal, feet, and heads.

There was only one long hunt in Chaco Brasil during the time I registered hunting yields. This hunt took place during the dry season and entailed a visit to one hunter's pascana,

TABLE 4.5
AVERAGE DISTANCE TRAVELED TO HUNT
BY HOUSEHOLD AND SETTLEMENT, 1989

PUERTO MENDEZ			
HOUSEHOLD #	AVERAGE (km.)	ST. DEV.	# TRIPS
14	3.25	3.18	2
15	2.83	2.16	12
16	3.67	4.04	3
18	1.88	1.04	11
19	0.65	0.49	2
AVERAGE	2.45	2.06	
CHACO BRASIL			
21	3.25	2.47	2
22	2.10	3.36	9
23	2.83	4.41	15
24	3.58	2.19	7
25	1.40	.0	1
AVERAGE	2.78	3.52	
CHACAL			
26	6.72	1.49	4
27	40.49	.0	1
28	6.62	1.67	2
29	8.91	3.73	4
30	10.40	9.50	2
32	17.12	.0	1
AVERAGE	11.01	9.52	14
AVERAGE FOR THE THREE SETTLEMENTS	4.13	5.72	(n=78)

ANOVA sum of squares= 810154.18; D.F.= 2; mean square= 405077.09; F.= 17.7758; sig. 0.0000

a transitory residence that some Chimane have in the forest. These dwellings in the forest seem to have been more important in the past. When I visited this particular pascana, the hut and the agricultural fallow next to it were not well kept. I was told that they do not carry out long hunts in the forest as they used to because their agricultural fields in the nucleus next to the Maniqui Viejo kept them too busy too dedicate more time to hunting. Therefore, both Puerto Méndez and Chaco Brasil are settlements where agriculture has taken on greater importance and affected hunting practices.

Table 4.5 shows the average distance traveled to hunt by household in the three settlements. The overall average distance traveled to hunt for the three settlements is 4.13 kilometers (s.d. 5.72), and there are significant differences among the settlements (anova sig.= 0.0000).

As pointed out earlier, Chacal stands out from the other two settlements with an average distance traveled of 11 kilometers versus the averages of 2.45 kms in Puerto Méndez, and 2.78 kms in Chaco Brasil, because hunting trips in Chacal were recorded during the dry season illustrating long hunts to pursue much desired white-lipped peccary meat.

Table 4.6 shows the average quantity of game obtained by successful hunting trips. For the three settlements, the average amount of meat obtained was 12.30 kgs. per trip per household. Although there is no significant difference in the average amount of game obtained by successful hunting trip

TABLE 4.6
AVERAGE AMOUNT OF GAME OBTAINED BY SUCCESSFUL HUNTING TRIP BY HOUSEHOLD AND SETTLEMENT, 1989

HOUSEHOLD #	AVERAGE (kg.)	ST. DEV.	# TRIPS
PUERTO MENDEZ			
14	0.09	.0	1
15	5.10	3.40	7
16	2.42	1.67	3
18	15.56	11.78	8
19	2.16	2.66	2
AVERAGE	8.18	9.46	
CHACO BRASIL			
21	5.12	2.69	2
22	6.89	5.71	8
23	5.41	10.24	10
24	10.18	7.74	7
25	28.87	.0	1
AVERAGE	7.84	8.82	28
CHACAL			
26	12.43	10.73	4
27	3.63	.0	1
28	21.24	18.83	2
29	14.88	10.80	4
30	82.01	48.31	2
32	63.91	.0	1
AVERAGE	27.38	31.43	14
AVERAGE FOR THE THREE SETTLEMENTS	12.30	18.33	(n=63)

ANOVA sum of squares= 4094.2226; D.F. 2; mean square= 2047.1113; F= 7.3390; sig.= 0.0014

between Puerto Méndez (8.18 kgs.) and Chaco Brasil (7.84 kgs.); Chacal again stands out with a high average number of kilograms of meat obtained (27.38). This figure once again reflects the acquisition of highly valued peccary meat. The total amount of game meat obtained during the research period in Puerto Méndez was 188.31 kgs., in Chaco Brasil 289.51 kgs., and in Chacal 403.61 kgs. It is of note that the thirty days spent in Chacal, more than twice as much meat was hunted than in the sixty days recorded in Puerto Méndez. This amount is also larger than that obtained in Chaco Brasil in sixty days.

Efficiency. Recent studies on optimal foraging theory (see Hames and Vickers 1983), attempt to understand a hunter's behavior in terms of the costs involved in pursuing game and the benefits obtained. This is usually measured in terms of efficiency, that is the number of kilograms of game obtained per hour, or per kilometer. In this context, an efficient hunter would be one who obtains more game with the least effort. However, a hunter's behavior cannot be precisely predictable because often there are extra-economic risks and issues that cannot be quantified when measuring efficiency (Baksh and Johnson 1990).

There are a number of issues a hunter takes into account when he is making decision about hunting. Some of the more obvious issues a hunter considers are the time invested, the distance traveled, and the risk involved acquiring game. Into

these considerations is also factored the actual probability of acquiring the prey.

For instance, one may assume that either the Chimane of Puerto Méndez are more effective hunters because they do not travel far to obtain meat, or the Chimane of Chaco Brasil are more effective because they obtain a higher variety of game. Those from Chacal may be considered better-off because they are able to go farther for highly desirable prey.

Table 4.7 illustrates a measure of efficiency among the settlements in terms of number of kilograms of game obtained per hour spent hunting. The average game yield for the three Chimane settlements is 2.26 kg/hour (s.d. 2.39). In Puerto Méndez, there is a higher number of kilograms obtained per hour (3.1 kg/h) than in Chaco Brasil (1.66 kg/h) and Chacal (2.26 kg/h). However, there are no significant differences among the average number of kilograms obtained per hour in each settlement. This is because there is a very high standard deviation in each case. This reflects the high variation within each extended household cluster where some households are specialized in obtaining meat while others are specialized in working in agricultural fields (see Piland 1991 on Chimane agriculture).

Also, other factors discussed earlier account for the differences, such as ecological differences among sites in species availability and preferred kill sites in each settlement.

TABLE 4.7
AVERAGE KILOGRAMS OF GAME OBTAINED PER HOUR BY SETTLEMENT

SETTLEMENT	AVERAGE (KG/HOUR)	ST. DEV.	# CASES
Puerto Méndez	3.10	5.03	20
Chaco Brasil	1.66	1.74	28
Chacal	2.26	2.39	13
TOTAL AVERAGE	2.26	2.39	61

ANOVA sum of squares= 24.4632; D.F.= 2; mean square= 12.2316;
F= 1.1245; sig.= 0.3318

The Chimane from Puerto Méndez and Chacal are able to obtain ammunition regularly because they are close to market circuits. This situation enables them to use modern technology more often than those Chimane who live in Chaco Brasil.

The Chimane from Puerto Méndez, in becoming more sedentary, have had to develop new strategies to meet their protein needs. However, their response contrasts to that found among other indigenous groups such as the Yanomami (Saffirio and Scaglion 1982). While the Yanomami have intensified the frequency of group hunts that take them to distant areas where game animals are available, the Chimane have changed their hunting focus from large to small animals in the vicinity of their settlement.

The Chimane, who are undergoing rapid social change due to the degradation of the habitat surrounding their settlement, and increased participation in the market economy, have chosen to stay in their settlement rather than moving to a new area where resources may be more plentiful. The Chimane from Puerto Méndez spend nearly the same average time hunting as the Chimane from Chaco Brasil, but their hunting yields reflect the degradation of their environment. The Chimane prefer to hunt small animals near their settlement rather than going frequently deep into the forest to hunt. Additionally, they engage more often in activities, such as wage labor and cash-cropping, that may enable them to obtain meat from market circuits.

Evaluation of Hunting Pressure and Sustainability

The question of sustainability of hunting is one that has been studied only in the past few years. Rates of harvest should not exceed rates of reproduction of game species if faunal resources are to be exploited sustainably (Robinson and Redford 1991: 415-429).

After reviewing studies of potential production of some game species, Robinson and Redford (1991: 424) present rates of potential harvest for some game species in terms of number of individual animals harvested by square kilometer.

In table 4.8 I present estimates of harvest rates for some game species based on the information in table 4.2 in order to compare them with suggested sustainable harvest by Robinson and Redford (1991). The figures refer to harvest rates calculated dividing the number of animals hunted by the catchment area, and adjusted to express a one-year period harvest rate.[7]

The comparison suggests that, overall, the Chimane in the Beni Biosphere Reserve hunt Agouti paca, Dasyprocta sp., Sciurus sp., Dasypus novemcinctus, and Tayassu tajacu under the limits of sustainable harvest. However, there are other

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[7] For example, there was one Cebus apella hunted in Puerto Méndez in a 60-day research period. The figure 1 is divided by the catchment area 1 (1/31.36=0.03188). This result is then multiplied by 365 days, and divided by 60 days in order to produce a harvest rate based in a one-year period.

game species that the Chimane hunt over the threshold of sustainability. The species in danger of being overhunted, and eventually locally extinct, are Cebus apella, Alouatta sp. and Tayassu pecari. There is no information available on sustainable harvest rates for the rest of the species listed in table 4.2.

In terms of the studied settlements, Primates are endangered in Puerto Méndez and Chaco Brasil, but not in Chacal. In Puerto Méndez, the harvest rate for Tayassu tajacu within the 10.9 km2 catchment area is unsustainable. Agouti paca is harvested beyond a sustainable rate in Chaco Brasil within the 10.5 km2 catchment area.

It must be kept in mind that these are mere estimates that could be helpful to understand hunting pressure in the Reserve. They are not to be taken as actual hunting yields. Many game species are not represented because they were not hunted during the research period. This, of course, does not mean that species such as deer, tapir, and spider monkeys are not occasionally hunted where available in different parts of the Reserve.

Primates and white-lipped peccaries are the most preferred animal species for the Chimane. This reflects a pattern found among other societies in which the most commonly taken animals are relatively large and frugivores (Redford, in press). It is possible that some primate species were not

TABLE 4.8
ACTUAL HARVEST RATES COMPARED TO SUSTAINABLE HARVEST RATES

Catchment areas:

	Puerto Méndez	Chaco Brasil	Chacal
1. 100% :	31.36 km2	30.7 km2	90.2 km2
2. 90% :	10.9 km2	10.5 km2	-

Harvest Rates (no./km2/year) per Catchment Areas 1 and 2

	Puerto Méndez		Chaco Brasil		Chacal	BBR*	Sust.** Harvest
SPECIES	1	2	1	2	1		
C. apella	0.193	0.556	0.595	1.739	-	0.49	0.18
Alouatta sp.	0.193	0.556	0.396	1.159	0.135	0.49	0.39
Agouti paca	0.388	1.116	0.991	2.898	-	0.86	1.31
Dasyprocta sp.	1.36	3.906	-	-	-	0.86	8.98
Sciurus sp.	0.193	0.556	0.198	0.580	-	0.25	44.83
Dasypus novemcinctus	0.776	2.233	0.396	1.159	0.675	1.36	5.19
Tayassu tajacu	0.969	2.789	0.396	1.159	-	0.86	2.41
T. pecari	-	-	0.595	1.739	2.293	2.46	0.83

*This is an estimate based on the area of the Beni Biosphere Reserve (135 km2).

** Sustainable harvest rates as suggested by Robinson and Redford (1991).

represented during the research period (such as black spider monkeys) because they were already locally extinct, probably because of habitat destruction or overhunting not only by Chimane but by non-indigenous people as well. The analysis of hunting yields, however, shows that the Chimane use of resources respond to the availability of game. Although it would be possible for some households to move to areas where preferred game species are available, many choose to stay because of other advantages that the location of their settlement has to offer.

In the case of Puerto Méndez, for instance, the Chimane who live there are facing a situation in which fewer large game animals are available. Instead of moving to other areas, these Chimane choose to stay because they have access to market circuits close to their settlement. One recurrent response to the question of why these Chimane stayed in Puerto Méndez if they had the choice to move to other areas, was that they did not have to suffer travelling far to sell their agricultural produce to obtain cash that was used to buy clothes, sugar, bread and other items such as tape recorders.

Discussion and Conclusions

This chapter discussed hunting practices among the Chimane who live in three settlements in the Beni Biosphere Reserve. Hunting is an important subsistence activity that yields an important food supply for the Chimane. Game is

rarely used for exchange, although it is true that in the past some Chimane households were engaged in the exploitation of hides and pelts for non-indigenous patrones.

Hunting was analyzed in terms of the cultural and social context in which it takes place, technology used to hunt, type and quantity of game obtained, location of hunt sites, time invested and distance travelled to obtain game. In the last two sections I discussed the questions of efficiency and sustainability of hunting among the Chimane.

Although the Chimane do not seem to be selective about the game they hunt, the data show that the Chimane are harvesting some species of primates and white-lipped peccaries above suggested rates of sustainable harvest. Although the Chimane use resources extensively, there is more hunting pressure on preferred species because of their taste, size, and symbolic value. Among the Chimane as in other indigenous groups (cf. Stearman 1989), it is very prestigious to be a good hunter.

Nonetheless, the Chimane hunting system is flexible to the apparent availability of resources and is also responsive to market situations. Those Chimane who live closer to market circuits are hunting less, and are dedicating more time to activities whose products can help them obtain cash such as agriculture.

It is therefore possible to devise management options with the Chimane that could insure the long-term availability

of endangered species. One first step should be to investigate the actual availability and the ecology of the endangered species, and establish hunting regimes based on factual data. The Chimane must actively participate in devising management options for hunting species.

CHAPTER 5
EXTRACTIVE SUBSISTENCE ACTIVITIES II
FISHING

Introduction

A little over 13% of the hunts recorded during the research period also included fishing trips. Probably the initial purpose of many of those hunts was actually to fish, but if game was encountered such as a bird or a capybara, the opportunity to hunt them was not missed.

In terms of successful outcome, fishing offers the Chimane a more secure source of food than hunting. Fishing can be performed daily in nearby water sources and always, at least small fish are certain to be caught.

In his early travels through Bolivia, Nordenskiöld (1924) had already reported on the original development of some Chimane technology and water transportation. Some canoes that the Chimane make today retain the characteristics that Nordenskiöld observed. Chimane canoes have a perforation at the tip of the bow in order to place a pole through it which secures the canoe in place along the edges of the river. This is particularly practical in the dry season when the level of the water is low and there is an ample beach between the water and the vegetation on river margins. The pole or, singa in

regional Spanish, also serves the purpose of propelling the canoe forward when the river is low. In many instances it proves more effective than using paddles, and because these poles are made from bamboo stems that grow on the river edges, they are not hard to obtain or replace.

Fishing takes place year round. The Maniqui river, or *Cojiro*, as the Chimane call it, can become a dangerous place during the rainy season if it overflows its course, washing out the vegetation and buildings that may be located on the river banks. During this time the Chimane fish along smaller rivers - *ojñi'*, *jinac* (creeks), *tsique'* (lakes), or carefully on the Maniqui when the flood waters recede.

The Cultural Context

The Chimane know how to use the resources rivers have to offer and they have developed a set of beliefs that help them explain the benefits and dangers that living next to rivers can pose. Just as *jebacdye'*, the game animals, have "owners" so do *tabedye'*, the fish. In Chimane belief, there are two important forces that control fish resources. One is *i'dojore'*, a beneficial protector that provides the Chimane with fish. The second one is *o'pito'*, an evil force.

According to many Chimane, i'dojore' is pleased with the Chimane because they do not waste the fish. They consume all of it, except the inedible entrails. I'dojore' has helpers (mozos) called *tsique'cantyi*, mythical people who live in the

lakes and assist him in taking care of the fish.[1] The Chimane affirm that they can only see the tsique'cantyi with the help of a cocojsi' (shaman) during rituals. Some affirm that the tsique'cantyi are Chimane people who live in another dimension in underwater houses. When a cocojsi' calls the tsique'cantyi they come in their canoes. The tsique'cantyi use *mijmama*, the caimans, as canoes; that is why the caimans are feared and, usually, not killed because the Chimane do not want to interfere with the protection and reproduction of the fish nor do they want to anger i'dojore'.

The other force that controls fish resources is o'*pito'*, the rainbow. While i'dojore' benefits the Chimane by giving them his fish, o'pito is a constant source of fear among the Chimane. Some Chimane assert that o'pito also owns some fish that he does not want to share with the Chimane. Others argue that o'pito does not own fish, o'pito' only selfishly monopolizes them, and knows how to cause harm.

O'pito' is particularly ubiquitous in calm and/or stagnant waters, such as lakes, ponds, some river bends, slow moving creeks, and even puddles. Anything can disturb o'pito' who in response will cause harm to the offender. More than one death has been attributed to the power of o'pito'. When

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[1] Some authors (cf. Pérez Diez 1987; Riester 1978) have documented the role of *mucu'cantyi* (people of the hills) in Chimane belief. When I asked the Chimane who live in the Reserve about this, only some of them responded that they knew about mucu'cantyi (there are no hills in the Reserve) but most knew about tsique'cantyi.

o'pito' provokes someone's death, it is said to return later to the victim's home by taking the form of an animal such as *co'shifore'* (Caiman yacare) in order to secure more victims. This is one of the reasons why the Chimane move when someone dies: to escape from o'pito'.

Most fish are edible (see Appendix B), although a few are forbidden to pregnant women or when someone is sick. Stingrays are eaten occasionally, but as in the case of capybara, because their non-indigenous neighbors do not consume them, the Chimane hide from others the fact they are eating stingrays. At any rate, stingray liver oil has a high market value because it is regionally used as a medicine for respiratory ailments. The sting is also valued because it is thought to be a numbing medicine for toothaches.

Research Methods

In order to evaluate fishing among the Chimane, I followed a similar procedure as in recording hunting yields (see chapter 4) with a few differences. Although the sample population for each settlement is the same, there were more people who fished. Men, women and children contribute to the acquisition of fish. Although in the three communities the bulk of the fishing activities relied on the male and female head of the household (68.1% of 191 fishing trips), young adults (15.3%) and children (16.6%) participated as well.

Additionally, the information I obtained on each catch was not as detailed as that of hunting yields. Because I was

interested in recording the total amount of fish caught and my informants were usually eager to cook their catch, I often weighed all fish from different species together, especially if a number of different small fish were obtained by the same person in one trip.

After a few days of recording yields, it became clear to me that some of the small fish caught by children with hook and line on the river margin were under-reported. These fish were usually caught early in the morning, and inmediately roasted and eaten for breakfast by the children themselves. When I tried to record these fish, the children played down the importance of their catch. They argued that the fish was too small, and it was caught only for fun or just to practice. Though it was true that the fish were at times very small, these fish were nutritionally important because many mornings it was the only food certain households had for breakfast.

Fishing yields were recorded during the same period of time as described for hunting yields in Puerto Méndez, Chaco Brasil, and Chacal. The scientific names used here should be considered as close estimates because fish species were identified not with vouchers but by using technical drawings from a report about the Mamoré river (the Maniqui is a tributary of the Mamoré) by Lauzanne and Loubens (1985), and with the help of Chimane informants. Slides were used to verify some fish species with the assistance of João Paulo Viana, a graduate ecology student from University of Florida.

Technology

The Chimane most commonly fish with hook and line, arrows, machetes, and barbasco or fish poison. Nets are a recent introduction by non-indigenous neighbors.[2] Reportedly, fish-hooks were made in the past out of chonta (Astrocaryum sp.) wood chips. Now the Chimane obtain hooks and line from traders or occasional visitors. Sometimes the Chimane obtain long pieces of wire that they cut in pieces from which they fashion hooks. A nylon line is tied to the hook and thrown into the river with bait to catch fish. The Chimane like to have several sizes of hooks to catch different fish.

Small fish, such as *cum* (a general name for different fish: Characidae family, Tetragonopterinae subfamily) are used as bait. These are obtained by attracting them to the surface with food scraps and rapidly caught with a machete. Sometimes, pieces of medium-sized fish are used as bait in order to obtain larger fish. At other times small mice and the entrails of mammals are used to catch fish. Fruits such as that from the Cecropia sp. tree or grapefruits are also used as baits. One frequent practice, especially among children, is to leave a hook with bait with the line secured to the river edge overnight. Large fruit-eating fish such as *távara*

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[2] Although it has been reported that some people use dynamite to obtain fish in the area, I have never seen Chimane make use of it.

(Megalodoras irwini) and even a few stingrays were caught in this way during the research period.

Table 5.1 shows a significant difference (chi-square= 138.83407; sig.= 0.0000) in the ways that fish were caught in the three settlements. In Chaco Brasil, 80.8% and in Chacal 77.8% of the fish were caught with hook and line; the rest were caught with either arrows or fish poison (chito'; vashi'; conofoto'). On the other hand, in Puerto Méndez only 22.4% were caught with fish-hooks. Fishing seemed to be a more important activity in Puerto Méndez than in the other two communities. The Chimane from Puerto Méndez used a variety of technologies to obtain fish, 20% of the fish caught was with bow and arrows in a nearby lake. Machetes were used in 17.6% and nets 22.4% of the fishing trips. The rest was caught with barbasco.

Nets allowed the Chimane to obtain relatively large quantities of fish in a single trip. These were specially important when some fish were migrating upstream to spawn.

Seasonal streams are preferred sites to *ñuttyi* (catch fish with barbasco). There are three common fish poisons that the Chimane use: *chito'* (Tiphrocia vogeli, T. tóxica), *conofoto'* (Hura crepitans), and *vashi'* (unidentified).

Barbasco fishing can also take place in river bends when the water is very low. In every case, the Chimane dam (*na'maqui*) a section of the stream or river where the poison

TABLE 5.1
INSTRUMENTS USED IN FISHING BY SETTLEMENT, 1989
(in percent)

INSTRUMENT	P. MENDEZ (n= 85)	C. BRASIL (n= 78)	CHACAL (n=27)
Hook & line	22.4	80.8	77.8
Arrow	20.0	1.3	3.7
Machete	17.6	1.3	0
Chito'	11.8	0	0
Vashi'	0	5.1	0
Conofoto'	1.2	0	18.5
Hook/arrow	1.2	11.5	0
Net	22.4	0	0
Hands	3.4	0	0
Total	100.0	100.0	100.0

chi-square= 138.83407; D.F.= 15; sig.= 0.0000

will be used. Men, women, and children from different households participate in this activity which is as much social as it is economic. All participate in obtaining the fish poison, and men usually build the dam. The dam is constructed by blocking the circulation of water, most commonly (in the Reserve), with palm leaves and poles of *mana'i* (Scheleea princeps) and *shuru'* (Gynerium saggitatum). Where available, the bark of *cajñere'* (Ochroma sp.) is also used. Sometimes I saw that old *pegpe'*, woven mats made of *mana'i* leaves, were used to dam a stream. Once the area is poisoned, men and young boys are alert with bow and arrows or machetes, women and young girls with machetes or just their bare hands to quickly catch the fish that become *shu'qui*, literally "drunk". Meanwhile some women remain on the shore preparing a hearth and/or cleaning the fish that others in the groups have caught. There are usually high fishing yields during these events. Surplus fish is generally smoked for future use.

There are two kinds of chito' (Tiphrocia vogeli and T. tóxica), both are cultivated shrubs. The Chimane harvest enough leaves which are hand-squeezed and diluted in the water to poison the fish. Sometimes the Chimane put the leaves in a woven bag (*sára'ij*), dip the bag in the water and proceed to squeeze the bag.

Conofoto' is the resin of a tree (Hura crepitans) which is tapped, mixed with mud, and then diluted in the area where

fishing is going to take place. As in the case of chito', sometimes the conofoto' mud balls are placed in a woven bag and then diluted with water. It takes a little more planning to fish with conofoto' than with the other techniques because of the effort involved in locating and tapping the right trees.

The third poison commonly used is vashi' (unidentified) which is a woody vine that is gathered in the forest. The Chimane cut at least 40 to 50 pieces of about 50 centimeters each to use in group fishing trips. The cut pieces of vine are tied up in groups of 10 to 15, placed in the water and smashed very hard to obtain the poison out of the vine. Some Chimane said that there were other vines called *toboi'*, and *ñu'bubu* or *yo'bobo* commonly used as fish poison in areas upstream in the Maniqui outside the Reserve.

There are important cultural practices involved with barbasco fishing. In every case, before taking up a *ñuttyi* trip, men and women must refrain from sexual intercourse. Nor should pregnant women be present during the trip preparation, especially during the dilution of the fish poison lest the effectiveness of the poison will be diminished.

The Chimane perceive that chito' is less effective than vashi', while conofoto' is the most effective of the three. I am not aware of any studies that measure the relative effectiveness of any of these fish poisons, but their use has become a source of conflict with neighboring non-indigenous

people and, to a certain extent, with the administration of the Reserve. In 1989, there were several complaints from rural peasants that streams were contaminated and that children and animals had gotten sick from using the water that had been poisoned upstream.

Discussion of fishing yields

Table 5.2 shows the different types of fish caught during the research period. Overall, the most common fish caught were *vonej* (Prochilodus nigricans), *jutiru* (Pimelodus sp.), *irimo'* (Serrasalmus sp.), *pincushi* (Pimelodina flavipinnis), and *siyasiya* (Triportheus sp.). There were also important catches of *sisij, tsitsi, vátse,* and *co'ro* (small Callichthyidae and Loricariidae fish) in Puerto Méndez during the dry season.

Fishing yield differences among the settlements can be explained in terms of the location and seasonality of fishing sites, the time invested in fishing, the distance traveled to fish, the number of people fishing, and the strategies/ technology used. Other considerations are the degree of involvement in other activities that are used for subsistence, namely, hunting, and agriculture, and to a lesser extent, wage labor.

As mentioned earlier, Puerto Méndez and Chacal are both located on the Maniqui river, while Chaco Brasil is located on an old course of the Maniqui, called Maniqui Viejo. The characteristics of the two rivers are quite different. The water level of the Maniqui Viejo is getting lower every year.

TABLE 5.2
PERCENTAGE OF FISHING TRIPS IN WHICH VARIOUS FISH SPECIES WERE CAUGHT

FISH SPECIES	P. MENDEZ	C. BRASIL	CHACAL	AVERAGE %
Prochilodus nigricans	41.2	18.2	32.0	30.5
Pimelodus cf. maculatus	2.4	58.4	24.0	28.3
Serrasalmus sp.	3.5	46.8	40.0	26.2
Pimelodina flavipinnis	3.5	36.4	40.0	21.9
Triportheus sp.	2.4	39.0	16.0	19.3
Serrasalmus cf. nattereri	7.1	35.1	-	17.6
Pterygoplychthys multiradatus	30.6	-	4.0	14.4
Hoplias malabaricus	22.4	1.3	16.0	12.8
Salminus maxillosus	21.2	2.6	-	10.7
Curimata sp.	16.5	6.5	-	10.2
Hoplosternum littorale	22.4	-	-	10.2
Sorubimichthys planiceps	7.1	9.1	20.0	9.6
Pseudoplatystoma fasciatum	9.4	11.7	4.0	9.6
Pterygoplychthys sp.	20.0	-	-	9.1
Schizodon fasciatum	1.2	14.3	4.0	7.0
Hoplosternum thoracatum	15.3	-	-	7.0
Roeboides sp.	2.4	3.9	24.0	5.9
Hoplerytrinus unitaeniatus	11.8	1.3	-	5.9
Raphiodon vulpinus	9.4	1.3	4.0	5.3
Ageneious sp.	-	10.4	8.0	5.3
Megalodoras irwini	9.4	-	-	4.3
Hypophthalmus sp.	7.1	1.3	-	3.7
ishij	7.1	-	4.0	3.7
Phractocephalus hemiliopetrus	-	5.2	8.0	3.2
cotyij	1.2	2.6	8.0	2.7
Rhytiodus sp.	4.7	-	4.0	2.7
Gymnotus sp.	5.9	-	-	2.7
Pterodoras granulosus	5.9	-	-	2.7
Astronotus ocellatus	2.4	1.3	8.0	2.7
Cichla ocellaris	1.2	-	12.0	2.1
pasha'	3.5	-	4.0	2.1
taquedye	-	2.6	-	1.1
Tetra	2.4	-	-	1.1
Leiarus sp.	2.4	-	-	1.1
Acestrorhunchus sp.	2.4	-	-	1.1
Potamotrygon sp.	-	2.6	-	1.1
Plagioscion squamosissimus	-	1.3	-	0.5
Loricariichtys cf. maculatus	1.2	-	-	0.5
Hemisorubim platyrhynchos	1.2	-	-	0.5
Leporinus trifasciatus	1.2	-	-	0.5
Leiarius marmoratus	-	1.3	-	0.5
Colossoma macropomum	-	-	4.0	0.5
NUMBER OF FISHING TRIPS	85	77	25 =	187

The current is not as strong as that in the Maniqui river. Much of the fish caught in Chaco Brasil year-round are *copinaty* and *irimo'* (Serrasalmus spp.), fish that remain in low water rivers or flooded areas where there is much underwater vegetation (Goulding 1980). These fish were not a common catch in the Maniqui but were caught several times in oxbow lakes in Puerto Méndez and when the water was low in Chacal. These piranha fish are very bony and therefore hard to eat, but the Chimane agree that the good taste of the meat makes up for the bones. Serrasalmus spp. are mainly caught with *yovi'* (hook and line), although often they get away because they can easily cut the line with their sharp teeth and release the hook. Therefore, hooks are highly valued in Chaco Brasil because they often lose them to the piranha fish.

Table 5.3 shows the type of water sources most commonly used to fish in the three settlements. Overall, 66.3% of the fishing took place in a river. One fifth of the total fishing took place in an oxbow lake. The rest of the trips were either to seasonal streams in the forest or the savanna when flooded, or to seasonal lakes in the savanna.

There is a significant difference (chi-square= 93.48349; sig.= 0.0000) among the studied settlements in terms of the areas most frequented to fish. Whereas most fishing trips in Chacal, and nearly all in Chaco Brasil were to rivers, half of the fishing trips in Puerto Méndez took place in nearby oxbow lakes. Oxbow lakes were especially important fishing sites

TABLE 5.3
TYPE OF FISHING SITES IN PERCENT BY SETTLEMENT, 1989

FISHING SITE	PUERTO MENDEZ (n= 86)	CHACO BRASIL (n= 77)	CHACAL (n= 27)	TOTAL (n= 190)
River	36.0	98.7	70.4	66.3
Oxbow lake	50.0	0	0	22.6
Seasonal stream in the savanna	4.7	0	11.1	3.7
Seasonal stream in the forest	8.1	1.3	18.5	6.8
Seasonal lake in the savanna	1.2	0	0	0.5
TOTAL	100.0%	100.0%	100.0%	100.0%

chi-square= 93.48349; D.F.= 8; sig.= 0.0000

year-round. Men preferred to fish alone in the oxbow lakes with bow and arrow because they said that too many people would make noise and scare away the fish. Fishermen affirmed that it was best to fish in this way around noon in the summer, because the water got very hot and the fish came near the surface where they were easier to catch with a bow and arrow. Many *vonej* (Prochilodus nigricans) and *copinaty* were caught in this way. As indicated previously, barbasco fishing was the main activity in the seasonal streams. However, because the water in these streams was usually low, it was possible for the Chimane to catch fish with a machete or with old mosquito nets. This was especially true in the dry season.

Tables 5.4 and 5.5 show the average time spent and distance travelled on fishing trips, respectively. Overall, the Chimane spent an average of 4.58 hours per fishing trip (s.d. 3.68 hs) travelling an average distance of 3.53 kilometers (s.d. 5.26 km). There were significant differences among the three communities in terms of duration of fishing trip (anova sig.= 0.0000), and in the distance travelled to fish (anova sig.= 0.0010).

The Chimane from Chacal spent more time on a fishing trip (7.87 hs) and travelled farther (7.29 km) than those from Chaco Brasil (4.72 hs/ 3.03 kms) and Puerto Méndez (3.6 hs/ 2.96 km). The differences can again be explained in terms of the location of the settlements. The Chimane from Puerto Méndez do not have to travel very far nor spend much time to

TABLE 5.4
AVERAGE FISHING TRIP DURATION BY SETTLEMENT, 1989.

SETTLEMENT	AVERAGE TIME*	ST. DEV.	# CASES
Puerto Méndez	3.6 hs	2.25 hs	79
Chaco Brasil	4.72 hs	3.35 hs	66
Chacal	7.87 hs	6.33 hs	21
TOTAL AVERAGE	4.58 hs	3.68 hs	166

ANOVA sum of squares= 1093485.3416; D.F.= 2;
mean square= 545642.6708; F= 12.8384; sig.= 0.0000

*Note: hs= hours.

TABLE 5.5
AVERAGE DISTANCE IN KILOMETERS TRAVELED TO FISH
BY HOUSEHOLD AND SETTLEMENT

PUERTO MENDEZ			
HOUSEHOLD #	AVERAGE	ST. DEV.	# CASES
13	3.68	7.25	13
14	5.17	12.06	10
15	2.38	1.33	10
16	3.64	1.80	10
17	1.80	1.46	5
18	2.14	1.42	23
19	2.47	1.28	15
AVERAGE	2.96	5.03	
CHACO BRASIL			
21	2.70	4.90	29
22	3.23	3.68	21
23	2.83	4.04	15
24	4.40	3.41	5
25	3.40	4.14	5
AVERAGE	3.03	4.19	
CHACAL			
26	9.86	10.92	9
27	4.48		1
28	5.38	5.69	4
29	5.90	3.32	9
AVERAGE	7.29	7.50	
AVERAGE FOR THE THREE SETTLEMENTS	3.53 km	5.26 km	(n=184)

ANOVA sum of squares= 372168.32; D.F.= 2; mean square= 186084.16;
F= 7.1810; sig.= 0.0010

obtain fish, because they are next to the Maniqui, and close to oxbow lakes and seasonal streams.

In Chaco Brasil, the Chimane have to go somewhat farther and spend more time to obtain a good catch because the level of the water in the Maniqui Viejo is diminishing. On the other hand, Chacal poses a special case. I recorded fishing yields only during the dry season when Chimane like to travel and visit relatives along the way, even if it is for a short time. Moreover, in this community the primary focus of the foraging trips was usually hunting rather than fishing. One evidence for this mobility is the sight of groups of crudely built huts where Chimane have temporarily moved to catch fish, especially those that migrate in schools.

Table 5.6 shows the average amount of fish obtained by fishing trip by household and settlement. Overall, the Chimane from the three communities obtained an average of 2.74 kg of fish (s.d. 3.23 kg) per fishing trip (n=186). This amounted to a total of 1,391.4 kg of fish for 117 people in 150 days.

However, there were some differences among settlements and also among the households in each settlement. The total amount of fish obtained in sixty days in Puerto Méndez was 284.16 kg, and in Chaco Brasil 162.98 kg. The total amount of fish obtained in thirty days in Chacal was 62.79 kg. Fishing was clearly more important in Puerto Méndez than in the other two settlements.

TABLE 5.6
AVERAGE KILOGRAMS OF FISH OBTAINED PER FISHING TRIP
BY HOUSEHOLD AND SETTLEMENT

HOUSEHOLD #	AVERAGE (kg.)	ST. DEV.	# CASES
PUERTO MENDEZ			
13	1.73	1.54	13
14	2.02	1.45	10
15	3.32	2.63	10
16	4.05	3.71	10
17	1.53	1.42	5
18	4.02	2.84	21
19	5.05	5.31	15
AVERAGE	3.38	3.33	84
CHACO BRASIL			
21	2.06	2.94	29
22	2.71	4.96	20
23	1.78	2.03	17
24	1.37	0.84	6
25	2.13	1.97	5
AVERAGE	2.12	3.26	77
CHACAL			
26	1.78	1.13	10
27	3.56	2.08	2
28	2.20	2.81	4
29	3.22	3.30	9
AVERAGE	2.51	2.41	25
AVERAGE FOR THE THREE SETTLEMENTS	2.74	3.23	(n=186)

ANOVA sum of squares= 65.9401; D.F.= 2; mean square= 32.9700;
F= 32.2281; sig.= 0.0419

Contrary to hunting forays, many more people, including men, women and children go fishing. Most of the fishing yields, unless unusually high are not distributed raw to other households. If someone from a different household is present when it is time to eat, he or she is invited to eat part of the cooked meal, but would not be given raw fish to cook in his/her household. Only in Puerto Méndez did I register cases in which fish was sold in town. In one case it was *sona'are'* (surubí: Pseudoplatystoma fasciatum), and in another, *cajsare'* (dorado: Salminus maxillosus). Most of the other fish Chimane eat are not desirable food to the other people of the region.

The male head of household #18 went to town after a good catch and sold a 7.94 kg and a 3.13 kg surubí for Bs. 15 (US$ 6.25) and Bs. 6 (US$ 2.5), respectively. On another occasion, the same person sold a 1.77 kg dorado for Bs. 2 (US$ 0.83). It is noteworthy that this household was one of the most productive in terms of fish procurement (averaging 4.02 kg per trip; s.d. 2.84 kg) and it only consisted of four people: two adults, an infant and a young boy. Thus, this household was able to share with other Chimane and also had a small surplus to sell in the market. He used the money obtained from selling fish to purchase clothes for his children, bread and alcohol.

In Chaco Brasil, three households out of five were more engaged in fishing. For them it formed part of the daily round to go by canoe to preferred remansos (slow moving water at

river bends) where they could fish. As pointed out earlier, much of the fish caught in this community were small piranha, although there were occasional high yielding catches of surubí and Megalodoras irwini.

In Chacal, fishing in the dry season did not seem to be a very important subsistence activity. The Chimane from this community put more emphasis on organizing trips to hunt peccaries. Out of the seven households surveyed only four did any fishing at all thirty days of data collection, and only two households fished more than five times.

Finally, table 5.6 shows a measure of efficiency, kilograms of fish obtained per hour in each settlement. An average of 0.82 kg/h (s.d. 1.28 kg/h) was obtained in the three settlements. There are significant differences (anova sig. 0.0004) among the settlements.

Although there is a high standard deviation which indicates that some households may be more efficient than others within a particular settlement, overall the Chimane from Puerto Méndez are more efficient at fishing (1.23 kg/h), than those in Chaco Brasil where the average was 0.42 kg/h and in Chacal where the average was 0.58 kg/h.

This results reveal the favorable conditions in Puerto Méndez to fish. The Maniqui river, especially in the wet season, is still a good source of fish. Moreover, Puerto Méndez is located near oxbow lakes that allow fishing year round.

TABLE 5.6
AVERAGE KILOGRAMS OF FISH OBTAINED PER HOUR BY SETTLEMENT

SETTLEMENT	AVERAGE (kg/hour)	ST. DEV.	# CASES
PUERTO MENDEZ	1.23	1.62	77
CHACO BRASIL	0.42	0.40	65
CHACAL	0.58	1.26	20
TOTAL AVERAGE	0.82	1.28	162

ANOVA sum of squares= 24.4962; D.F.= 2; mean square= 12.2481;
F= 8.0941; sig.= 0.0004

The proximity of these water sources with their abundant fish permit successful fishing without taking away time from the Chimane to practice agricultural activities for subsistence, or for neighboring non-indigenous households that pay the services with cash or market goods.

After the water level drops in the Maniqui during the dry season, the Chimane from Puerto Méndez are able to harvest the fish that remain in the small oxbow lakes before they are totally dry. They waited long enough to harvest the fish so they were not too small. Most of the fish harvested in this way are vátse, sisij (small Callychthyidae and Loricariidae), and small vonej (Prochilodus nigricans). The latter is a migrating fish (Goulding 1980). The fish spawn in the oxbow lake, when they are big enough the Chimane catch them with anything they can, from old mosquito nets to bare hands. Before the oxbow lake is completely dry, most of the fish that were dropped here have been harvested for local consumption.

Conclusions

Fishing is an important subsistence activity among the Chimane who live in the Reserve. Because the Chimane have developed a number of techniques to obtain fish, they are able to secure this resource year-round from a variety of water sources, ranging from rivers to seasonal streams in forests and savanna areas.

There is a lack of specific scientific information on the ecology of the fisheries that the Chimane use. Therefore, it is not possible to evaluate fishing harvest rates.

The use of fish poisons has been a source of conflict between Chimane and non-Chimane in different areas of the Reserve. While some researchers argue that it is unlikely that fish poison could be used to an extent that could actually poison streams, others argue that the use of this technique should be banned until careful studies have been carried out. These indigenous practices must be carefully examined to evaluate the long-term availability of fishing resources and at the same time determine the impact of the poison on the quality of the water that others use to drink, cook, and bathe.

Other studies on lowland South American indigenous groups, however, have demonstrated that frequent use of fish poisons can contribute to the depletion of fisheries, especially in small tributaries of large rivers (cf. Baksh 1985). Although the fisheries that Chimane appear plentiful, more research needs to be done in order to assess long term processes of change.

CHAPTER 6
CHIMANE SUBSISTENCE SYSTEM

In this chapter I will give a general account of Chimane gathering and agricultural activities. A discussion of the Chimane subsistence system will follow in order to assess the relative importance of each activity in the settlements that I surveyed.

Gathering

Gathering offers a welcomed variety to the Chimane diet when there are fruits, honey, and eggs that are seasonally available. Gathering is performed by men, women, adolescents, and children. Its importance as a food procurement activity is difficult to quantify because it takes place constantly when going to the forest and while performing other activities, such as hunting, or on the way to visit relatives. Fruits and berries are usually consumed where they are picked and only a fraction of what is actually gathered reaches the settlement. The gathering of foodstuffs gives variety to the diet, especially during the wet season when a great number of trees are fruiting.

Much of the gathering takes place in the forest, forest islands in the savanna, and in old fallows. In fact, some

Chimane often take trips to gather at sites which, reportedly, belonged to their forefathers but that they no longer actively manage. This is especially true when gathering *väij* (Bactris sp.) and citrus fruits such as sweet limes and grapefruits.

Many generations ago, the Chimane made seasonal expeditions to a region called Patsene, in the Upper Maniqui river area in the Serranías de Eva-Eva, to collect salt (cf. Hissink 1955). To this day there are stories that the elders tell about how difficult the lives of the Chimane were when they did not have salt, and had to make special trips to the Patsene to collect it. Now, the Chimane obtain salt from the market which is usually in the form of blocks. These blocks are cheaper than salt for human consumption because they are not fortified with iodine; they are primarily for cattle. The Chimane obtain these salt blocks by exchanging their agricultural products with traders, or as payment for their labor.

During the wet season I recorded important yields of Bactris sp. and *mana'i* (Scheelea princeps) in Puerto Méndez and Chaco Brasil. In Puerto Méndez, 135.68 kg of Bactris sp. and 26.46 kg of S. princeps were brought to the settlement; whereas 44.4 kg of Bactris sp. and 37.56 kg of S. princeps were brought to Chaco Brasil during a 30-day period in each case. These fruits were mainly eaten as snack food during the day. Some Chimane use S. princeps oil to make their hair

softer and shinier. Ashes of S. princeps racime coverings are also used to "sweeten" a cud of *sa'si'* (coca).

Other fruit recorded in Puerto Méndez included *ja'ru* (Jessenia sp.), *virui'* (Inga sp.), and sweet limes. The latter were obtained from old fallows. In small amounts the following were also consumed: *tsocon'* (Rheedia sp.), *ibijqui* (Rheedia achachairu), *mo'ai* (unidentified), *tiribó* (unidentified), *shocorate* (Theobroma sp.), *isi'ta* (Pseudolmedia sp.), *míto* (Vitex sp.), *bejqui'* (Hymenea sp.), and *jiji'* (Ardisia sp.).

At the end of July, some Scheelea princeps was collected in Puerto Méndez. Two gathering trips yielded almost 21 kg of the fruit although it was not fully in season. In Chacal, gathering of fruits did not seem to be an important activity in September-October, although some Hymenea sp. and other unidentified fruits were collected in small portions while travelling through the forest.

In order to climb high trees, some Chimane fashion a tree bark ring that they stretch around their ankles in order to help them climb while holding onto the tree.[1] While one man goes up the tree, the others cut large leaves to sit on and wait for the fruit to be cut. Once the fruit starts to fall they all quickly begin to pick them to eat on the spot and to fill their *sára'ij* (woven bags) to take some home for those who stayed behind. When gathering, the Chimane rarely cut the trees that supply fruits.

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[1] Nordenskiöld (1924) also noted this cultural trait.

The Chimane do often cut the trees that hold wild honey; *coroma*, honey, is a highly valuable resource for its good flavor and also for the exchange value it has. Native bees are smaller and yield less honey than those locally called cruceña. These are the agressive Africanized honey bees.

On one occasion, it took two men almost three hours to cut with axes a conofoto' tree (Hura crepitans) of about 160 cm of diameter. While men cut the tree, women usually sit and chat nearby among themselves as their young children play nearby. On these excursions the Chimane try to wear long sleeved shirts and shoes to avoid bee stings. As soon as the tree falls they quickly begin to burn dry Scheelea princeps leaves to produce abundant smoke in order to drive away the bees. Despite these precautions, it is not uncommon to see Chimane with swollen necks and faces after gathering honey because of bee stings. Women bring their pots and quickly begin to fill them up with honeycombs. Still at the site, the Chimane begin to eat the honey while spitting out the larva that they usually do not like to eat.[2]

It is difficult to determine how much honey is eaten or harvested. Suffice it to say that a good harvest yields enough to satisfy the harvesters with a surplus to be sold in town. The Chimane usually sold a bottle of honey for Bs 5.00 ($2.08)

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[2] In contrast to many other Amazonian groups, I have not found evidence that the Chimane regularly like to eat any kind of insects.

in San Borja in 1989. Some Chimane manufacture candles from beewax using cotton thread for wicks.

In the Beni region honey is valued for its medicinal properties in treating respiratory illnesses. Therefore, the demand for this product is driving some Chimane to harvest honey beyond their subsistence needs. This has also been a source of conflict between Reserve park rangers and some Chimane and peasant communities who cut trees in order to obtain this resource.

Another important resource that the Chimane gather are *fen*, eggs. Birds such as *júparej* (Rhea americana) are valued for their eggs, while others such as *fojfe* (Crypturellus undulatus), *fofor* (Tinamus major), *mara'se* (Ortalis guttata), *emej* (Penelope jacquacu), and *tobi* (Aburria pipile) are valued for their eggs and meat.

Other valued eggs are those from reptiles such as *co'shifore'* (Caiman yacare), *mijmama* (Melanosuchus niger), *quijbo* (Geochelone carbonaria), *ojina* (Platemys platycephala), and *meme'* (Podocnemis expansa). Some Chimane value Caiman yacare for their tasty tails while the latter three types of turtles are also valued for their meat, although ojina is considered a low quality resource for reasons that remained to be explored.

Late August, before the rains, is the season for turtle eggs. Turtles leave their eggs in *tij*, nests, on the river beaches where they are not difficult to find. The Chimane say

that there are usually about 35 eggs per nest, and commonly two or three nests are harvested at a time. When there is a high yield of these eggs, the Chimane dry them in the sun to eat them at a later time. Reportedly, they can consume these dried eggs up to a period of two months without spoilage.

Because turtle eggs are a valued resource among Chimane and non-indigenous people alike, there has been a great deal of pressure on this resource in the past decade. This has led national authorities to ban the gathering of eggs, but this prohibition is difficult to enforce.

There are many other forest and savanna resources that the Chimane use with medicinal and ritual purposes that are outside the scope of this discussion.[3]

Other gathered products include fish poisons like vashi' (unidentified woody vine), and conofoto' (Hura crepitans), as discussed earlier in chapter five. Moreover, a number of different trees and vines are used for construction, dyes, and manufacture of household objects. Mahogany (Swietenia macrophylla), palo maría (Callophyllum brasilensis), and cedar (Cedrela odorata) are preferred trees for canoes. The Chimane make wood containers to prepare *shocdye'* (manioc or maize beer). Sometimes instead of cutting a whole tree to make these containers, the Chimane only carve part of the butress of a

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[3] In 1989 Dr. Isao Kubo from the University of California studied the chemical properties of some plants that the Chimane used as medicine, and Gonzalo Oviedo studied ethnomedicine among the Chimane. Unfortunately, I have not been able to consult any of their reports.

large tree, such as that of *titi* (Ficus sp.).[4] Wood containers are valued regionally among peasants to make *ja'sha*, chivé (manioc flour) and manioc starch. A medium sized one (1 m x 1 m) sold for Bs 15 ($6.25) in San Borja.

Preferred poles to construct huts include *shibo'* (Astrocaryum chonta) and *chamet* (Tabebuia sp.), although other materials are also used. Roofs in the Reserve are usually made of Scheelea princeps or other palm leaves. Sometimes *shuru'* (Gynerium saggitatum) was used for roofs. *Cajtafa'* or jatata leaves are also used but to a lesser extent because they do not grow in the area of the Reserve. Those households which had jatata roofs had obtained the panels in trips they had made to upstream regions within the Chimane territory. Some Chimane from the Reserve were involved in the jatata trade as employees for the traders.

The source of fuelwood usually consisted of logs gathered from agricultural fields. Rarely did the Chimane cut trees for fuelwood because they already had dry logs available from the fields.

Cajnere', balsa wood (Ochroma sp.) is used to make platform beds, or sometimes walls. The Chimane also gather fibers from the balsa seed pod to sell in San Borja. The

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[4] Some Chimane informed that the reason they do not cut the whole tree is because it would be wasteful and its mythological "owner" would be furious with the Chimane that waste resources. Some, not all trees, have "owners".

texture of these fibers is similar to that of cotton and it is regionally used to stuff pillows and mattresses.

Clams are not eaten but the shells are collected to be used as spoons, or tools. They are especially useful as an instrument to give shape to clay pots.[5] The few Chimane women in the Reserve who still know how to make pottery carry out special trips to Puerto Méndez to obtain clayey soil.

One important resource for the Chimane women in the Reserve is *shuru'* (chuchío: Gynerium saggitatum) to make woven mats and fans. This resource is gathered year round, especially during the dry season when the river water level drops and the beaches where this plant grows are accesible on foot. Women do not cut the whole plant, but only that part of the upper stem that has leaves. Only young leaf shoots are used. These shoots are left in the sun to dry for a few days, after which they are woven into mats. Women use *ta'* (bark for tying) to fasten the mats. This bark is obtained from different plants such as *mu'* (Cochlospermum sp.). Seven to eight trees provide enough bark for a woven mat. Sometimes women do not need to cut standing Cochlospermum sp. for bark if they are already cut in agricultural fields or fallows. Twenty shuru' plants are necessary to make a standard size *shipna*, woven mat (1.70 m x 3.30 m). It takes a woman approximately two days to make a shipna. This is a source of

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[5] The material used to make these pots is *jac pirij*. This type of soil is dominated by clay and is susceptible to water logging (Piland, pers. comm.).

income for women who sell them for Bs. 5 ($2.08) in San Borja. These woven mats are used in town as wall or floor coverings. Rural peasants barter with the Chimane for these mats which they use to dry products such as chivé, balsa fiber, rice, cacao beans, coffee beans, coca leaves, etc.

Chimane Subsistence System

The Chimane complete their diet with products from their gardens. The agricultural system as described by Piland (1991) consists of housegardens, agricultural fields and agricultural fallows. Two thirds of a typical Chimane field contains rice and plantains, which provide the bulk of their diet and some surplus for market exchanges. Other important agricultural products include manioc, and maize.

The Chimane agricultural system is not one of polycropping but one of planting different varieties of a particular crop. For instance, there are more than 30 varieties of manioc that the Chimane cultivate in different fields. The Chimane may have from one to six active agricultural fields at a time, but most have an average of three fields per conjugal household. The average field size is 2815 sq.m., and they are usually located close to the farmers' homes (Piland 1991).

Abandoned housegardens and fallows are important sites for hunting; 12.3% of the kills documented in this research took place in the vicinity of agricultural sites. There are

more agricultural fields and fallows in older settlements like Puerto Méndez and Chaco Brasil, while very few in new ones such as Chacal.

One key finding is that those households that are more involved in agriculture seem to have less time to spend in hunting. Fishing is still practiced regularly but with different degrees of success. Further, more involvement in agriculture gives the Chimane more opportunities to participate in the market by obtaining cash or goods in exchange as will be illustrated in the following chapter.

Figures 6.1, 6.2, 6.3, and 6.4 show the relative importance of different subsistence activities in Puerto Méndez and Chaco Brasil. These figures compare the amount of land under cultivation in each household (Piland 1991), and the amount of meat obtained by household through hunting and fishing. Unfortunately, there was no reliable information on agricultural plots for Chacal.

In Puerto Méndez, household 19 had the most area under cultivation but had obtained the least amount of meat through hunting. Households 16 and 14 also had more land under cultivation and little amount of meat through hunting. On the other hand, households 15 and 18 had the least area under cultivation but had obtained a large amount of meat through hunting.

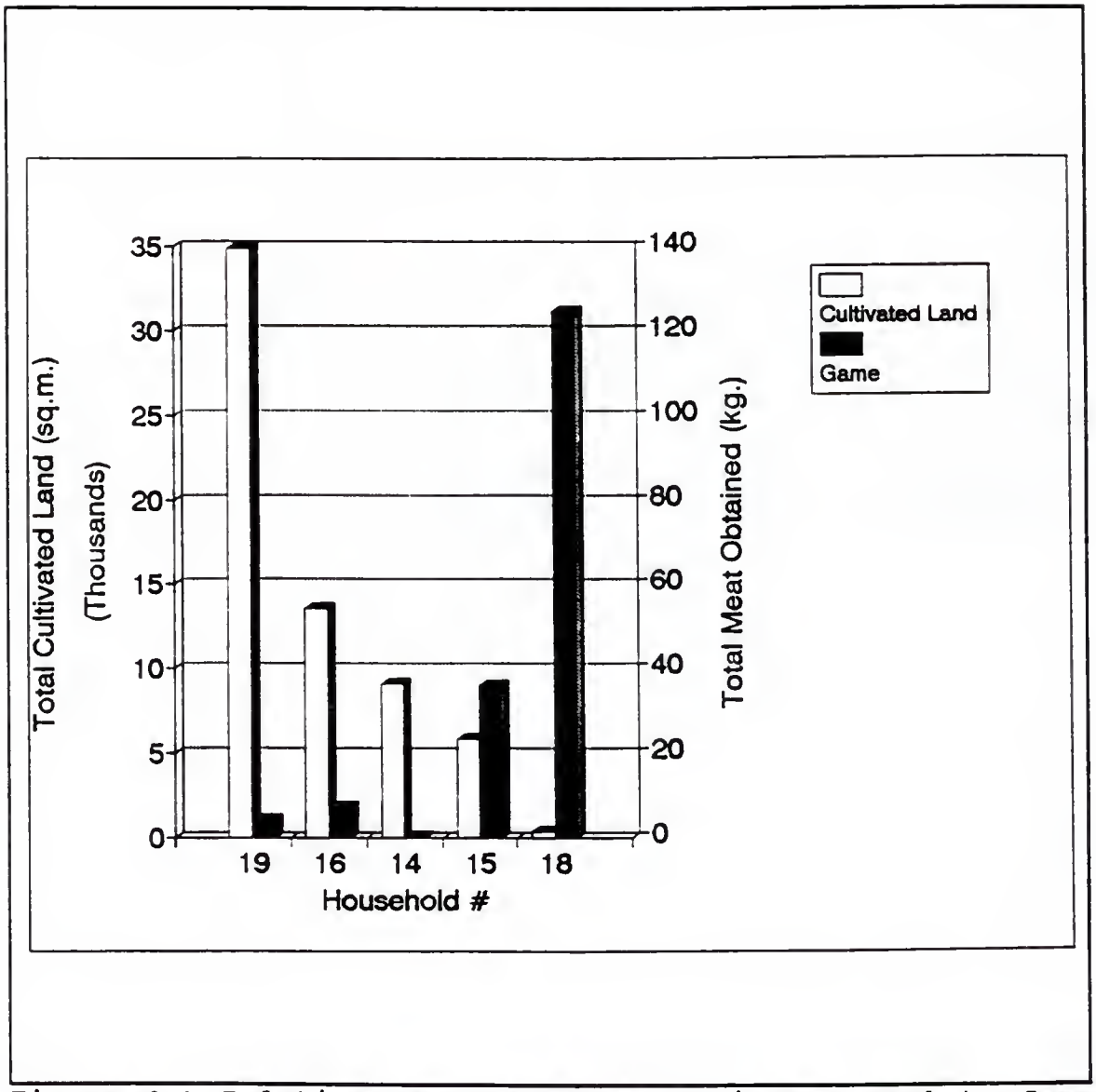

Figure 6.1 Relative Importance of Cultivated Land to Game Obtained in Puerto Méndez.

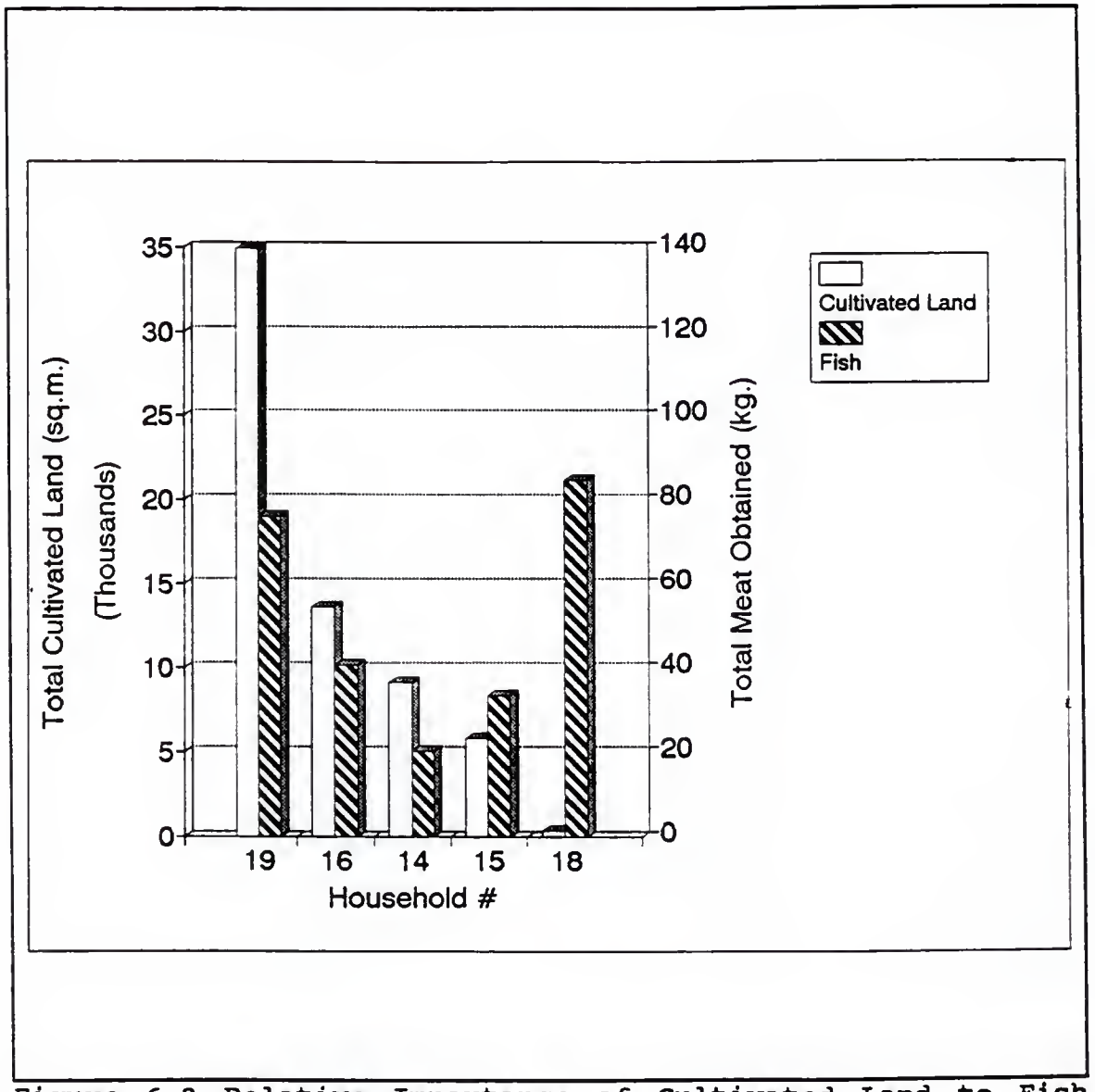

Figure 6.2 Relative Importance of Cultivated Land to Fish Obtained in Puerto Méndez.

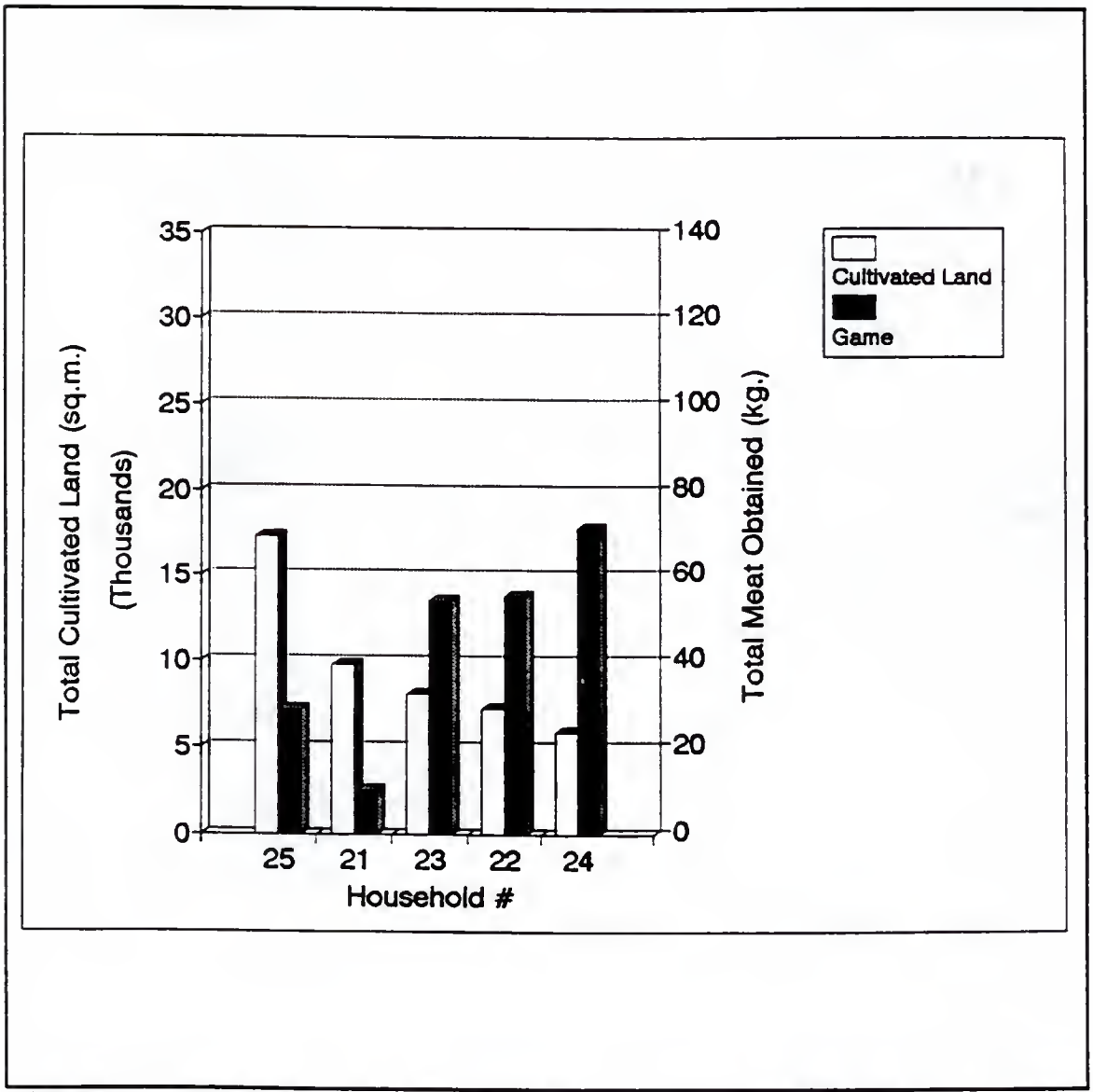

Figure 6.3 Relative Importance of Cultivated Land to Game Obtained in Chaco Brasil.

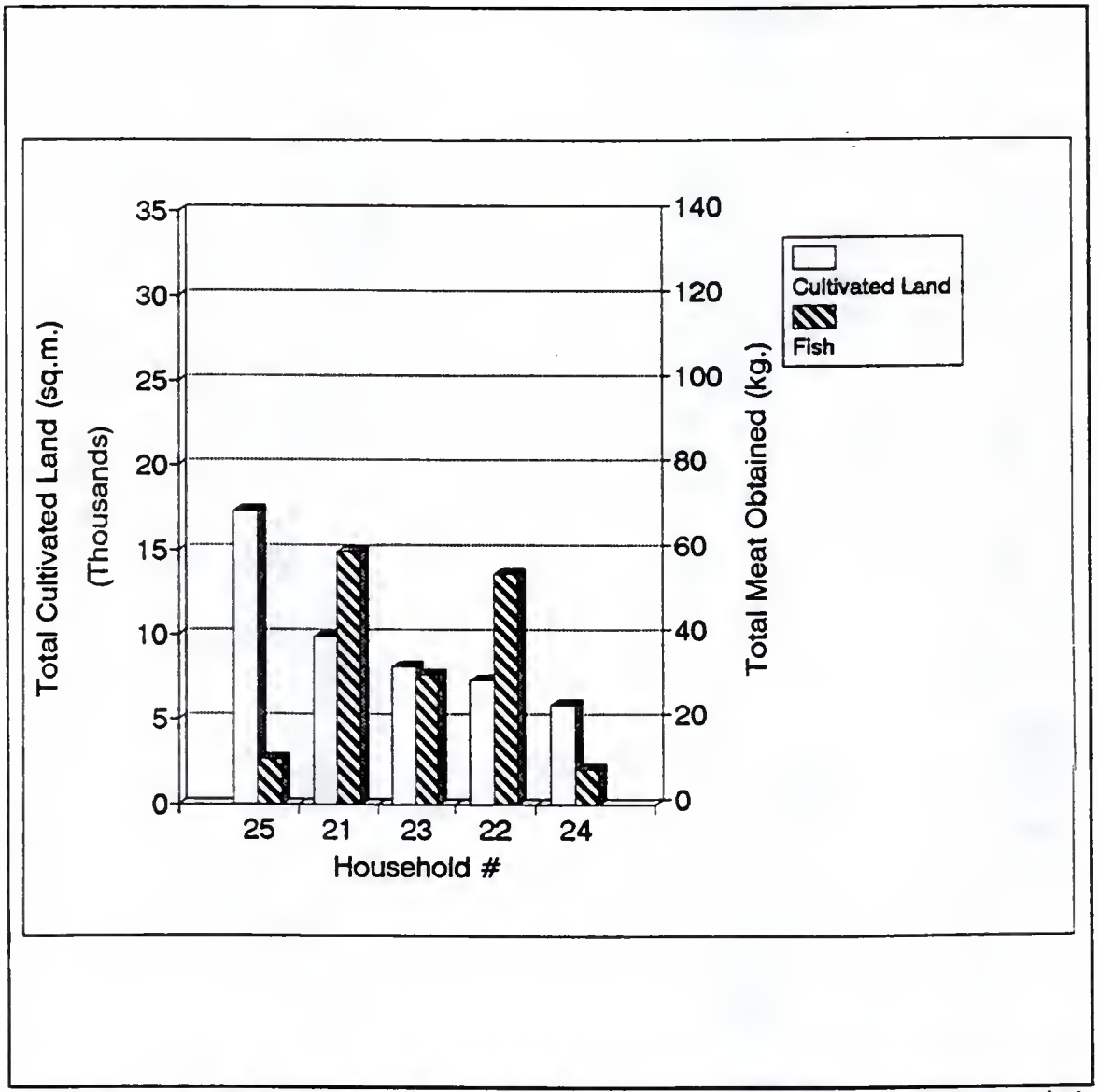

Figure 6.4 Relative Importance of Cultivated Land to Fish Obtained in Chaco Brasil.

Furthermore, households 18 and 19 had obtained relatively more fish than the other households. This pattern suggests an emerging specialization among households of the same extended household cluster. As mentioned earlier, although the unit of production is the conjugal household, the unit of consumption is the extended household cluster. Because the Chimane from the same extended household cluster pool resources, some emphasize agricultural activities while other emphasize foraging activities. In this way all members of the same extended household cluster are able to consume a wide variety of foodstuffs.

Figures 6.3 and 6.4 summarize the information for Chaco Brasil. Again a similar trend can be observed. Those with more area under cultivation obtained less meat from hunting. The exception was the head of household 25 who only hunted once but was able to obtain a heavy giant armadillo which he found in its burrow near his agricultural field. Fishing seems to be important in households 21, 23, and 22 but less important in households 25 and 24. Household 24 was the most successful in Chaco Brasil obtaining meat through hunting, and had the least area under cultivation.

Summary and Conclusions

The Chimane belief system regarding the use of resources is only a partial guarantee to avoid hunting, fishing, or

gathering beyond their subsistence needs because norms are not necessarily reflected on actual behavior.

There is evidence that market pressures may lead some Chimane to use resources unsustainably to satisfy market demands. This is especially true regarding the trade of products such as honey and turtle eggs. Trees are usually cut when harvesting honey, and over-harvesting turtle eggs can end the availability of this resource. Campaigns that prohibit the use of these resources can only have little impact if local people are not offered alternative means of obtaining cash.

Chimane subsistence must be seen as a system that emphasizes different resource use activities depending on the availability of resources, and involvement in the market economy. One important Chimane response to these conditions is to pool resources at the extended household cluster level in order to have access to a wide variety of foodstuffs. This strategy is especially important in Puerto Méndez because the Chimane who live there are currently experiencing the impact of land circumscription, and habitat degradation.

In order to maintain a viable system, the Chimane are trying to find ways within the market system to complement their subsistence. This is the context in which market involvement is examined in the following chapter.

CHAPTER 7
MARKET INVOLVEMENT

Introduction

The purpose of this chapter is to describe and analyze Chimane participation in the market economy and how that integration affects their quality of life. The data base for this chapter was obtained through structured interviews and participant observation.

Chimane market involvement usually takes place by selling or bartering agricultural and gathered goods, and by working for others for cash or kind. Because it was difficult to elicit the amount of income received for Chimane work, I measured the type and quantity of market goods obtained by the Chimane during the month before interviews took place. In order to understand the kind of social relationships between the Chimane and the people with whom they trade I will present a typology of traders and market exchanges.

Quality of life is assessed by examining nutritional status through anthropometric measurements, and incidence of illnesses. The focus is on children under 10 years of age because it is they who usually reflect the nutritional status of a community (Waterlow et al. 1977).

A concluding section evaluates Chimane participation in the market economy, and how the Chimane responded to external pressures.

Levels of Market Involvement

Some Chimane households, particularly those near towns and ranches, have been an integral part of the regional economy for a long time. Before air transportation and roads that linked the area with the Yungas and highlands, the Chimane were important suppliers of food and building materials for San Borja and ranches in the region. At that time, and in certain areas today, the links with the cash economy were weak. Transactions were only through barter. They were asymetrical because the Chimane could not control the supply of goods offered to them, and the traders established the terms of exchange in their favor. Nordenskiöld observed that "along the Maniqui river, the Indians are particularly exploited by the white people" (1922: 124, orig. in French). He reported that a Chimane had to work in a ranch for six months in order to be able to buy a mosquito net.

Because the Chimane remained owners of their means of production and occupied an extensive territory, they were usually able to flee to other areas when they wanted to avoid contact with outsiders. This is no longer possible among the Chimane. The need for market goods to secure their resource base in the face of new settler occupation, and a desire to

participate in the regional and national life have led the Chimane to be responsive to contact with outsiders especially through market links.

Methods. Some Chimane participate in the market more than others. In order to assess levels of involvement in the market I constructed an index of material wealth which shows how income was used in different households. Other indicators include the number of market exchanges in the month before the interview was carried out, the amount of money spent in one month in each settlement, and the incidence of barter in each settlement. I argue that a settlement is more involved in the market than others when there are more households within the settlement that own durable market goods; when households exchange products and obtain (or pay) money for them (instead of bartering), and when they engage more frequently in outwork.

Material wealth

Table 7.1 is an index of material wealth that shows the type of durable market goods that the Chimane own in the three case study communities. There are clearly two groups of goods: those that are common in every household, and those which are difficult to obtain.

The most common items owned include kerosene candles, spoons, fish-hooks, plates, mosquito nets, machetes, knives,

TABLE 7.1
INDEX OF MATERIAL WEALTH
(Guttman scale)

HOUSEHOLD #	PRODUCTS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	SCORE
16	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+		16
31	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			15
26	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			15
32	-	+	+	+	+	+	+	+	+	-	+	-	+	+	+			15
21	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+			15
28	+	+	+	+	+	+	+	+	+	+	+	+	+	+				14
19	+	+	+	+	+	+	+	+	+	+	+	-	+	+			*	14
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+				14
13	+	+	-	+	+	+	+	+	+	+	-	+	+					13
27	+	+	+	+	+	+	+	+	-	+	-	+	+					13
18	+	+	+	+	+	+	+	+	+	+	+	+						12
23	+	+	+	+	+	+	+	+	+	+	+	+						12
25	+	+	+	+	+	+	+	+	+	-	+							11
22	+	+	+	+	+	+	+	+	+	+	+							11
29	+	+	+	+	+	+	+	+	+	+	+			*				11
17	+	+	+	+	+	+	+	+	+	+	+							10
14	+	+	+	+	+	+	+	+	-	*		*						9
24	+	+	+	+	+	+	+	+										8

Coefficient of reproducibility: 0.948
Coefficient of scalibility: 0.636 Scale errors: 16

Note: Products 1. kerosene candle 2. spoons 3. fish-hooks 4. plates 5. mosquito nets 6. machetes 7. knives 8. aluminum pots 9. shovels 10. aluminum cups 11. axes 12. flashlights 13. radio-cassette player 14. firearms 15. adze 16. rice seeder 17. chisel.

Information not available for households 13, 15 and 20.

The + sign indicates that a household owns at least one of the products indicated, the - sign indicates the lack of it. The * sign indicates that a household owns a product but causes an "error" in the scale.

This scale shows the type of material goods that a household owns, and it shows how income has been used. A coefficient of reproducibility of .90 or greater is considered significantly close to a perfect scale (Guttman 1950 cited in Bernard 1988: 45).

and aluminum pots. Kerosene candles or mecheros are items that are made out of old cans or glass jars. The Chimane fashion a cotton wick. Only one household in the sample did not own a kerosene candle but instead used a beeswax candle as a source of evening light.

Spoons are also obtained through the market; some households also use clam shells as spoons. Fish-hooks are necessary purchases to obtain food. Small hooks are especially valued because they are used to catch small fish for food or for bait in order to catch larger fish. Enamelled metal plates are another common possession, although it is not unusual to improvise "disposable" plates from banana leaves or other broad-leaved plants.

Mosquito nets are a basic necessity and having one is a sign of independence for young adults. A couple with their small children sleep under the same large mosquito net on large woven reed mats. As a child becomes an adult and desires more independence, he or she will usually try to produce goods to exchange for a mosquito net.

Machetes and knives are also essential for subsistence work. Almost everyone, even children, owns a knife. They carry a knife with them at all times, especially when going through the forest to visit someone. These are particularly useful in case Chimane may find some palatable forest product to eat that requires a knife to harvest it. Aluminum pots are important to cook in, they are more durable and less prone to

break. Very few households own clay pots for cooking. Those who do, use the clay pots only as water or manioc beer containers.

Items 11 through 17 are less commonly owned. Not every household owns these items but they are usually shared within a settlement. The use of flashlights, radio-cassette players, and firearms are restricted because of the difficulty in obtaining batteries and ammunition to operate them. When batteries are available the Chimane virtually play the radio constantly. There is a program on the San Borja radio station at noon each day that transmits messages to people who live in the countryside. Recently, this form of communication has been essential to summon Chimane from far away settlements to participate in meetings in San Borja dealing with land rights.

The scale also shows that rice seeders and a chisel are the least commonly owned items because they are harder to obtain. A rice seeder is a technological improvement that permits the owner to cut down on labor expenditure because it is possible to plant rice quicker. Chisels are used to make canoes. Because few households are making canoes at one time, a Chimane may borrow a chisel from the original owner when needed.

Purchases and wage labor

Table 7.2 shows the mean number of market items obtained per household, by settlement, in the month before the

TABLE 7.2
MEAN NUMBER OF MARKET GOODS OBTAINED IN ONE MONTH
PER HOUSEHOLD BY SETTLEMENT

SETTLEMENT	AVERAGE	ST. DEV.	# HOUSEHOLDS
Puerto Méndez	11.7	4.13	6
Chaco Brasil	6.2	3.63	5
Chacal	11.4	3.95	7
TOTAL AVERAGE	10.05	3.93	18

ANOVA sum of squares= 103.0968; D.F.= 2; mean square= 51.5484;
F= 3.3351; sig.= 0.0633

the interview. There were fewer items obtained in Chaco Brasil than in the other two settlements. The proximity of Puerto Méndez to San Borja makes it easier for the Chimane to go to town to exchange products, and it is also easier for itinerant traders to go on foot to this settlement. When traders come on foot to Puerto Méndez to exchange products, they often hire Chimane to bring the products received in exchange for goods upstream to town in their own canoes. Chacal is also accsesible to San Borja by canoe but Chaco Brasil is not; between Chacal and the mouth of the Maniqui Viejo there are a number of palisades and currents that make travel difficult.

Table 7.3 shows the amount of money spent in one month by household and settlement. According to these results, Chaco Brasil is the least articulated into market circuits. The Chimane who live there are far from San Borja; it is difficult for them to travel to exchange products for cash. Therefore, they mainly barter with neighbors from El Remanso or nearby ranches.

On the other hand, those Chimane from Puerto Méndez and Chacal have access to money because they have the opportunity to go to San Borja and obtain cash for their products. It is noteworthy that traders who visit Chimane settlements almost never exchange with cash. They most often barter. The Chimane usually obtain money for their products when they offer them door-to-door in San Borja, or when working for others.

TABLE 7.3
MONEY SPENT IN ONE MONTH
BY HOUSEHOLD AND SETTLEMENT

Puerto Méndez

HOUSEHOLD #	AVERAGE Bs.	ST. DEV.	CASES (n=45)	TOTAL Bs. %
14	1.39	0.87	10	9.2
15	3.17	3.45	6	12.5
16	8.10	5.99	7	37.3
17	2.93	2.22	14	27
18	2.61	3.55	7	12
19	3.00	0	1	2
AVERAGE	3.38	3.76		(100.0)

Chaco Brasil
-All trade involved non-monetary exchanges.

Chacal			(n=61)	
26	2.83	3.59	9	9.5
27	1.86	0.89	9	6.2
28	3.66	3.89	14	19.1
29	2.50	0	1	0.9
30	4.37	3.71	8	13
31	7.22	8.80	13	35
32	6.21	6.09	7	16.3
AVERAGE	4.4	5.43		(100.0)

ANOVA sum of squares= 27.0041; D.F.= 1; mean square= 27.0041;
F= 1.1721; sig.= 0.2815

There are differences among households in terms of how much they spend. In Puerto Méndez, over one third (37.3%) of the exchanges were carried out by household 16. As shown in table7.1, this household is also the one which owns the most market goods in the three settlements. This household consists of two adults, one 12 year old girl and five other children. The money household 16 obtains comes from their agricultural sales. They are the only ones in the sample who own a rice seeder, which has made it easier for them to obtain more rice with less labor input. Rice can be stored for a long period of time, thus it is a source of cash and food year round.

Household 17 is second in money spent in Puerto Méndez. The male head of this household has only one small agricultural field, but he obtains money by working in agricultural fields of non-indigenous neighbors. He also occasionally works for traders that go to the Upper Maniqui river area to obtain *jatata*.

Household 31 was responsible for over one third (35%) of the money spent in Chacal. The Chimane from this household are also second in the scale shown in table 7.1. There are seven adults in this household, four of them men who have well-tended agricultural fields. The women from this household obtain cash by selling *shipna'*, woven mats, in San Borja.

Household 28 was responsible for almost one fourth (19.1%) of the money spent in Chacal. This household consisted of two adults and three small children. Because these two

adults were outgoing and spoke better Spanish than the rest in Chacal, many itinerant traders first stopped here to exchange goods. On the other hand, household 29, which consisted of three elders, all three monolingual Chimane speakers, lived more on a subsistence level and was not much interested in buying market goods. Because of the distance, itinerant traders always traveled to Chacal by boat.

All exchanges in Chaco Brasil were through barter. Table 7.4 shows the type of Chimane goods exchanged for market goods. Overall, plantains were the most commonly exchanged (40.5%), and rice was second (14.9%). Maize and other agricultural products together made up for almost 15% of the products exchanged. Game was used for exchange only in Chaco Brasil (3.3%), although, reportedly, some Chimane from Chacal occasionally exchanged some peccary meat with a peasant neighbor. In Chacal other products exchanged included chicken eggs, chickens, turtle eggs, and honey. In the days before a visit to San Borja was planned, many Chimane actively sought products in the forest that could be exchanged in town. Honey was particularly valuable source of cash.

Finally, work for non-Chimane in Puerto Méndez and Chaco Brasil was carried out in order to obtain products such as jerked beef, salt, and sugar. The Chimane from Chacal did work for others but they reported that they obtained cash for their work.

TABLE 7.4
CHIMANE PRODUCTS MOST USED IN EXCHANGES
(in percent)

PRODUCT	P. MENDEZ (n=25)	C. BRASIL (n=30)	CHACAL (n=19)	TOTAL (n=74)
Plantains	40.0	33.3	52.6	40.5
Rice	24.0	10.0	10.5	14.9
Maize	8.0	13.3	0	8.1
Other agr.	8.0	10.0	0	6.8
Game	0	3.3	0	1.4
Fish	0	0	5.3	1.4
Eggs	0	0	10.5	2.7
Honey	0	0	5.3	1.4
Hen	0	0	10.5	2.7
Hat	0	3.3	0	1.4
Canoe rent	0	0	5.3	1.4
Outwork	20.0	26.7	0	17.6
Total	100.0	100.0	100.0	100.0

chi-square= 35.58457; D.F.= 22; sig.= 0.0336

Nearly all male adults reported working at least a few days a year for cash. The exceptions were two men over 50 in Chaco Brasil and two in Chacal, and a young man in Chacal who reported that he preferred to sell the rice he produced in order to obtain cash than ever work for others. Daily wages were Bs 10 ($4.17) without food, or half as much if the employer fed the workers lunch. Often the Chimane are paid with money and in kind, not just one or the other.

Table 7.5 and 7.6 show the type of items obtained from market circuits. The items have been arranged in order of most frequently obtained in the three settlements. The differences among the settlements were not statistically significant but the tables show a clear pattern.

Overall, sugar (14.6%) is the item most often obtained, followed by bread[1] (12.4%), and alcohol (12.4%). The nutritional value of these items is questionable, but traders often supply them because they are not highly perishable. The fresh meat (11.2%) obtained is usually of a low quality: offal, heads and feet; or in the form of charqui, jerked beef. This item accounts for one sixth of the exchanges in Puerto Méndez.

The Chimane from Puerto Méndez and Chacal obtain a larger variety of products than those from Chaco Brasil. The items listed reflect not only what the traders brought to the settlement but also what the Chimane obtained in town. On the

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[1] This category also includes crackers and cookies.

TABLE 7.5
FOOD ITEMS MOST OFTEN PROCURED BY SETTLEMENT
(in percent)

PRODUCT	P. MENDEZ (n=42)	C. BRASIL (n=9)	CHACAL (n=38)	TOTAL (n=89)
Sugar	9.5	22.3	18.4	14.6
Bread	11.9	11.1	13.2	12.4
Alcohol	11.9	11.1	13.2	12.4
Meat	16.7	11.1	5.3	11.2
Salt	4.8	33.3	7.8	9.0
Oil	11.9	11.1	5.3	9.0
Noodles	7.1	0	5.3	5.6
Coca	9.5	0	2.6	5.6
Soft drink	2.4	0	10.5	5.6
Chamairo*	2.4	0	7.8	4.5
Candy	4.8	0	5.3	4.5
Condiments	7.1	0	0	3.4
Dairy	0	0	5.3	2.2
TOTAL	100.0	100.0	100.0	100.0

*see text

chi-square= 25.87022; D.F.= 24; sig.= 0.3598

TABLE 7.6
NON-FOOD ITEMS MOST OFTEN PROCURED BY SETTLEMENT
(in percent)

PRODUCT	P.MENDEZ (n=28)	C. BRASIL (n=22)	CHACAL (n=42)	TOTAL (n=92)
Clothes	28.6	36.4	19.0	26.1
Soap	14.3	27.3	21.4	20.7
Kerosene/ gasoline	17.9	9.2	16.7	15.2
Ammunition	14.3	0	11.9	9.8
Batteries	7.0	4.5	9.4	7.6
Medicines	3.6	13.6	4.8	6.5
Cigarretes	10.7	0	4.8	5.4
Pots	3.6	4.5	2.4	3.3
Shoes	0	4.5	2.4	2.2
Agr. tools	0	0	4.8	2.2
Matches	0	0	2.4	1.0
TOTAL	100.0	100.0	100.0	100.0

chi-square= 16.84414; D.F.= 20; sig.= 0.6631

other hand, the products that the Chimane obtained in Chaco Brasil were largely a result of what the traders or neighbors had brought for bartering. Therefore, salt (without iodine) accounts for one third of the exchanges, followed by sugar (22.2%). Coca is a product that many Chimane cultivate and buy only when scarce in their gardens. Chamairo, the vine used with coca, is usually bought from highlander traders.[2]

Table 7.6 shows the variety of non-food items obtained by exchange in the three settlements. Overall, clothes are the most common item. Clothing accounts for over one fourth of the exchanges in Puerto Méndez (28.6%), and over one third in Chaco Brasil (36.4%). The clothes obtained are used and of a low quality. Sometimes women obtain sweaters in order to unravel them and use the wool to make *saraij*, woven bags.

In Chacal, soap (21.4%) accounted for a few more exchanges than clothes (19%), but soap ranked second in Chaco Brasil (27.3%) and Puerto Méndez (14.3%). There are two types of soap commonly used in the region. One is manufactured industrially in factories and can be obtained in stores while the other is locally produced and consists of wood ash and beef tallow.

Traders

An examination of the relationships between the Chimane and the traders with whom they deal sheds light on the

[2] See Davis (1983) for a description of the ethnobotany of chamairo.

strategies used to obtain market products. The traders have been grouped into six categories (see table 7.7). The first category anyone in San Borja, is self-explanatory. Many Chimane offer their products door-to-door, and buy what they need at any store. This option seems to be the preferred one (29.8%) because it gives the Chimane an opportunity to control the exchange, buying the items they want, not what the traders want to sell. These exchanges also permit bargaining.

One fifth of the exchanges were carried out with non-Chimane neighbors. These exchanges were particularly important in Chaco Brasil (67.7%). People from El Remanso went often to Chaco Brasil to obtain agricultural produce. One of the products that had high demand was manioc to make chivé, flour. Often the Chimane were coerced to give up their manioc although they did not want to do it because the payment (if any) was chivé manufactured from their own manioc. Coercive mechanisms involved threat and violence. The few documented times that the Chimane resisted these practices, violent incidents occurred that resulted in the death of individuals from both sides (Diez Astete 1988b). Moreover, it is not uncommon for a Chimane to arrive to his/her field and find that someone from El Remanso has stolen plantains, or other products. In sum, because the Remanseños would steal products anyway, the Chimane opted to give in to their barter demands so they would at least get something.

TABLE 7.7
EXCHANGES WITH PARTICULAR TRADERS
(in percent)

TRADER	P. MENDEZ (n=69)	C. BRASIL (n=31)	CHACAL (n=78)	TOTAL (n=178)
Anyone in San Borja	46.4	0	26.9	29.8
Neighbor/ rural peasant	23.2	67.7	0	20.8
Highlander trader	4.3	0	42.3	20.2
Small trader	15.9	0	20.5	15.2
Big trader	1.5	32.3	2.6	7.3
Juan's store	8.7	0	7.7	6.7
TOTAL	100.0	100.0	100.0	100.0

chi-square= 139.64656; D.F.= 10; sig.= 0.0000

The relationships between the Chimane from Puerto Méndez and their neighbors were more peaceful and involved a common Evangelical bond. In the early 1980s, an Evangelical missionary with his family lived in the area, and his influence could still be felt as neighbors occasionally would get together on Sundays for culto, service. They tried to help each other, and called themselves 'brothers' and 'sisters'. There were a few confrontations between neighbors and Chimane regarding the use of fallows, but they did not reach the point of violence as was the case in Chaco Brasil.

Overall, one fifth of the exchanges involved Collas, traders from the highlands. This category was more important for those from Chacal (42.3%) than for the other two groups. These traders had been arriving in San Borja since the late 1970s when the road to La Paz was opened and economic conditions in other areas of Bolivia worsened. The Collas' entrepreneurial mentality has given them a competitive edge in San Borja forcing some local stores to close down. Gradually, many collas have been able to accumulate enough money to build houses, and consolidate property in the area. Many own trucks and the products they market are not only foodstuffs from the highlands and Yungas, but also from Brazil, Chile and Peru. Because of the collas' Indian background, many Chimane feel closer and less threatened by the collas than by those from San Borja and neighboring peasants. Reportedly, it was advantageous for the Chimane from Chacal to establish links

with the collas because they gave them better terms of exchange.

The category, 'small trader', consists of those itinerant merchants who visit Chimane settlements with goods to barter. They did not reach Chaco Brasil because it was distant, but they did visit Puerto Méndez often (15.9% of the exchanges), and Chacal (20.5%). For these individuals, trading is but one of many subsistence strategies that they may have. Some have stores in the San Borja marketplace where they sell food. Others work part of the year on ranches, and yet others have their own agricultural fields which are not productive enough to sustain them. These traders are often aggressive when requesting Chimane products. The most common items they supply are medicines, which sometimes they falsely advertise as all-purpose miracle cures.

The category 'big traders' includes those individuals whose main economic activity is to trade long distances from San Borja to Santa Ana de Yacuma on the Maniqui river. In Chaco Brasil almost one third of the exchanges were carried out with them, while they were less important in Puerto Méndez (1.4%) and Chacal (2.6%). These traders owned one or more motor-boats and some hired mensueleros, employees that worked for them regularly and were paid monthly. These traders obtained cheese and jerked beef from the ranches which they, then, exchanged for agricultural products from the Chimane and other peasants. They supplied the ranches with much needed

rice, plantains, maize, and other agricultural foodstuffs that were needed to feed ranch personnel. They were much wealthier than the other traders.

The last category consists of a single individual, Juan (not his real name), whose store in San Borja is the meeting point for all Chimane who visit town. Juan is a widower highlander who arrived in San Borja over 25 years ago. Besides selling alcohol and maize beer, he also sells other essential products, such as salt and soap, to the Chimane. This is the only store where the Chimane feel welcome to drink in San Borja. Juan is respected among the Chimane, and has become the godfather of more than a dozen Chimane children.

In sum, Puerto Méndez and Chacal are more involved in the market economy then Chaco Brasil. The residents from Puerto Méndez rely more on the market for foodstuffs including meat. Chacal residents have a bit more control over the items they want to purchase and from whom. The links that Chaco Brasil has with the market resembles more typical patron-client relationships because of the extra-economic ties and coercion that put pressure on their patterns of production and consumption.

Quality of Life

In Chimane society where market involvement is relatively weak and the use of money is limited, measuring levels of

well-being cannot rely solely on the amount of income received in a certain period of time.

The logic of the Chimane economy is that of subsistence, primarily based on agricultural production and the extraction of fauna and forest resources. Barter predominates in areas away from urban centers, especially when the rest of the national economy is in crisis, and money scarce.

There is still much debate about the most appropriate criteria to measure levels of well-being (Webster 1984). In this study, I assessed quality of life by looking at some basic measures such as housing conditions, nutritional status, and access to services such as health and education (Grootaert 1982).

Housing conditions

The Chimane build their own dwellings with materials they obtain from the forest. Most houses do not have walls; but when present, walls are made of balsa wood or bamboo. In Puerto Méndez four out of six households slept on platforms fashioned as beds; in Chaco Brasil, all residents slept on mats on dirt floors, and in Chacal all households except one had platform beds. A couple and their small children sleep in the same mosquito net; this is one reason why a whole family becomes easily infected with a contagious disease when one member of the household is ill.

Clothes hang from the transversal poles that are part of the house. Most households have shelves where they store food

and other possessions. Only products such as rice or maize can be stored for long periods of time; everything else has to be consumed during a short time span. The cooking hearth is usually in the open, although sometimes it is located under its own structure. Typically, the Chimane dispose of garbage by throwing it behind the house or along the riverbanks; sometimes it is burned, but not very often.

Most of the year, the Chimane collect water from the river, but during the rainy season they collect water from seasonal streams where it is less dangerous than a full river with strong current. Women usually collect water, process food, dispose of garbage, and clean the house.

Nutritional status

Anthropometric measurements are valid indicators for nutritional status, especially among children under 5 years old (WHO 1986). Moreover, the specific measure of weight for height is independent of age between one and 10 years, making the comparison with a reference population possible (Waterlow et al. 1977). The weight for height measure indicates the state of present nutrition, and although there have been many criticisms against using a reference population based on white upper-middle class North-Americans, it has been demonstrated that given adequate material conditions, all ethnic groups may achieve the same growth standards. The objective in this study is not to compare the Chimane to people in other countries, but, rather, to compare the nutritional index among Chimane

settlements. In this case the index is a valid measure of relative nutritional status.

Weight for height offers measures of "wasting" while height for age offers measures of "stunting". When it is difficult to determine the age of an individual, the former is usually a more reliable measure.

Young children in Puerto Méndez fared well using these measurements. Among all the boys under 10 in Puerto Méndez,[3] only one four-month old baby's score was 78% of the 50th percentile standard (90% being the cut off point of malnourishment). This child, who was the youngest of eight children, was not getting adequate nourishment because his mother did not have enough breast milk. All the other children were over 90% of the 50th standard percentile for their category; twelve boys scored 100% or above. In terms of arm circumference measurements, the only one under the 13 cms. cut off point, was the same four-month old boy. Oddly enough, this child belonged to household 16, the same household that ranked first in the index of material wealth (see table 7.1).

All girls under 10 in Puerto Méndez scored 90% or above of the 50th percentile. In this group there were two girls who subsequently died: a two-year old who died in May, at the end of the wet season with an acute case of whooping cough, and a

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[3] I obtained weight measurements using a Chatillon scale for small children and a bathroom scale for children over 90 lbs. Infants' heights were obtained on a measuring board; those of older children were measured by marking their heights on a pole.

three-month old who was very healthy but died in an accident. The two-year old belonged to household 19, the second 'wealthiest' household in Puerto Méndez; while the three-month old belonged to household 17, the second least wealthy household in the same settlement.

In Chaco Brasil, only one one-year old boy scored 88% of the 50th percentile which indicated that he was moderately wasted. However, his arm circumference measure was 14.5 cms, one and half centimeters above the cut off point. This boy belonged to household 23, the second 'wealthiest' in this settlement. Among the girls, only a one and a half year old girl scored 87.5% of the 50th centile and her arm circumference measurement was 12.6 cms., indicating that her health was at risk. She belonged to household 24, the least wealthy according to the index in table 6.1.

All the boys and girls surveyed in Chacal scored above 94% of the 50th centile and above 13 cms in arm circumference measurement.

In sum, in none three settlements are there serious cases of malnutrition. So far, their economic strategies of livelihood have permitted them to attain an adequate level of nutrition. However, this does not mean that the situation cannot be improved.

Overall, women reported that two out of five children died before they reached the age of five. Nearly all children, and probably adults too, suffer from parasitic infections.

Through a local health campaign, children under ten received a dose of Mebendazole, and nearly all expelled parasites for several days. Because the sanitary conditions were not changed, it is likely that the children were soon re-infected with parasites.

In Puerto Méndez, one adult from one household, and a child from another were diagnosed with tuberculosis. Although it was recommended that they follow precautions so as not to infect others, these precautions were not heeded.

A common malady during the rainy season was severe colds. The mode of treatment was usually to give the ill person an antibiotic injection. These can be easily purchased over the counter in pharmacies and sometimes they are provided by traders.

In Chaco Brasil, severe colds were also common during the rainy season. In July, two children were infected with chicken pox. They treated the children with *ki* (Genipa Americana). Reportedly, the children also took stingray liver oil to get better. At the end of the wet season one seven-year old child who had a severe cold and fever died. Her death was attributed to a spell by *opito'*. A contributing factor in this death could have been an injection of expired antibiotic medicine.

In Chacal, all informants reported having been ill in the past rainy season with a cold; two adults complained of backaches, and two others reported having had diarrhea in the past year.

Every Chimane knows a little about how to cure certain illneses. They classify illnesses in two broad domains, those that can be cured by traditional healers, and those that have to be treated by Western medicine, usually through antibiotic injections. Many traders have been able to take advantage of this taste for Western medicines: some traders have gone to the extreme of promoting vitamin C shots as a remedy for snake bites, and even hemorrhages. Unfortunately, this has endangered many peoples' lives.

Access to services

The presence of the Bolivian state is relatively weak in the rural areas of the Beni. In San Borja, there is one police station but the officers' activities are limited because they lack transportation. There is one hospital where young medical doctors go to practice for a few months and then leave. One committed senior doctor was replaced after a change in the local government. It is not surprising that people like the Chimane prefer to seek help from their traditional healers rather than from doctors in town who do not understand their language or beliefs.

However, there are some non-governmental institutions that try to assist the Chimane and other rural populations through the organization of seminars and vaccination campaigns. One group that specifically helps the Chimane is the New Tribes missionaries. Other organizations that have provided them and other rural peoples with some support are

the Catholic Church, Save the Children, and the Beni Biosphere Reserve through a contract with Centro Interdisciplinario de Estudios Comunitarios (CIEC).

Because these organizations do not have the resources to do what the state should offer, their support has been limited and uneven. New Tribes missionaries mainly help Chimane who are linked to their bilingual schools; the Catholic Church helps those who are under their influence (Fátima Mission), Save the Children helped some Chimane through links with the missionaries, and CIEC helped some who lived in the Reserve.

New Tribes has a formal agreement with the Bolivian State to train Chimane bilingual teachers and give infrastructural support for Chimane schools. The missionaries have been active in seeking *ítems*, or permanent teacher positions paid by the government to establish schools in different Chimane settlements. Although there is a basic syllabus for each school grade, the missionaries have control over the type of texts the Chimane learn from. The emphasis is on learning to read and write, and in Bible studies. In 1989, New Tribes had 14 schools and had trained 17 bilingual teachers. This group of teachers formed the core of the newly created Chimane political organization.

There is also a school for Chimane at the Catholic mission in Fátima. There are four different teachers but it is bilingual only in the lower grades.

Discussion

The market economy influences the type and quantity of some resources that the Chimane exploit. Although Chimane involvement in the market is still relatively weak, there are certain periods when they actively seek forest resources to sell or barter. This is especially true if they are planning a visit to town. There is evidence of pressure on gathered products such as honey, turtle eggs, and sometimes live animals which are sold as pets.

Moreover, the Chimane respond to the demand for foodstuffs in the market by engaging in more intensive agricultural activities so they can sell products such as rice and plantains to obtain market goods. Because their agricultural products are often stolen in places like Chaco Brasil, the Chimane have to plan to have a surplus to cover for these losses.

The impact of the market on the use of game and fish resources is not direct. In the past, there was a large demand for hides and pelts, but currently the demand is very low. Only occasionally, traders demand to be paid with peccary skins, for example. The low demand is due to government and Reserve campaigns to protect the resources of the area. There is, however, an indirect impact of the market on the use of game. Because Chimane patterns of consumption are flexible,

some households obtain meat from the market rather than invest time in hunting. There are numerous ranches in the natural savanna of the region where cattle resources abound. Although the quality of the meat obtained is heavily salted, not very good or fresh, it constitutes an alternative source of protein for households located in areas where game resources have become scarce like in Puerto Méndez.

Nutritional status among the Chimane is adequate when compared to reference standards but it could be improved. The Chimane suffer from chronic parasitosis and respiratory illnesses, especially during the rainy season. It is also during this season that food resources are less abundant, so they have to rely more on market products. If there is any relationship between market involvement and nutritional status, this relationship is a negative one. The case of Puerto Méndez shows that the two households that have more material wealth (more involved in the market economy), are also the least healthy. There was a death of a child in each case during the research period.

It is more desirable among the Chimane to have more control over market exchanges. Therefore, they prefer to market their products themselves by going to town. However, in places like Chaco Brasil they have to tolerate patron-client relationships with neighboring peasants because of the climate of violence and fear.

CHAPTER 8
RESOURCE USE AND MARKET INVOLVEMENT

This dissertation began with an anthropological question that touched on socio-economic and ecological issues, namely, how is it that the Chimane produce their livelihood? Two corollary questions were to find out whether their subsistence practices permitted the Chimane to maintain an adequate quality of life in the context of their growing participation in the market economy, and whether these practices were, at the same time, compatible with the conservationist goals of the Beni Biosphere Reserve.

In order to answer these questions I chose to carry out a comparative study of extended household clusters in three different Chimane settlements. This choice was informed by the results of a survey I carried out in the Reserve during the first few months I worked in the field. The three settlements represented different scenarios of market integration and resource availability. Thus, I sought to present three distinct snapshots of a social process that is affecting the Chimane who live in the Bolivian Amazon: the expansion of the market economy. This process manifests itself in the Beni by the intensification of trading relationships, the settlement of non-indigenous people in indigenous territory causing

competition for natural resources, the demand for indigenous wage labor; and at the superstructural level, the modification of cultural beliefs and socio-political practices that have an impact on patterns of consumption, social behavior, and modes of organization.

Chimane Livelihood

Until recently, the Chimane remained relatively unacculturated because they never were successfully reduced in missions. The Chimane had, and to a certain extent still have, a dispersed settlement pattern. Because each household is potentially a self-sufficient unit, groups were not usually formed above the level of extended family clusters. A central authority, therefore, was an unnecesary component of their socio-political structure. The Chimane dispersed settlement pattern is a response to the need to use resources extensively, where a large area is exploited without exerting pressure on few resources. A large number and kind of animals and plants were used for food and other purposes.

I found that in all three settlements the Chimane practiced swidden agriculture, hunted, fished, and gathered to obtain food. Furthermore, many Chimane also exchanged products and practiced wage labor to supplement their subsistence needs. In each settlement, however, the Chimane responded to resource availability and market pressures in different ways. Their responses are a result of their particular history of

contact, and location of the settlement with respect to market circuits and within the Reserve. Thus, if we can imagine a particular combination of factors that point to a greater dependence on the market, Puerto Méndez and Chacal are more involved in the market economy than Chaco Brasil. Chaco Brasil has only weak ties with market circuits.

Chaco Brasil is located in a multiple use zone of the Reserve along the riverbanks of an old course of the Maniqui river, close to a buffer zone, and far from regular market circuits. The proximity to primary forest resources made it easier for the Chimane who lived in Chaco Brasil to harvest an extensive variety of fauna and flora resources. Hunting and fishing were equally important subsistence activities in this settlement. Gathering took place not only in the forest but especially in old housegarden fallows. The Chimanes' agricultural plots in this settlement produced enough to feed the Chimanes and a relatively small surplus that was used in exchanges. This agricultural surplus also covered the frequent robberies that the Chimane suffered from their non-indigenous neighbors. The predominant form of exchange was barter, where products were sometimes swapped on the spot, although most often they were paid for weeks if not months later. This deferred type of exchange ultimately benefitted the purchasers (non-indigenous neighbors) who paid less than what they agreed to at the moment of the purchase. There was little the Chimane could do in the face of this assymetrical exchange because

their neighbors manipulated the situation through fictitious kinship ties, firearms, and fear.

Chacal and Puerto Méndez are located along the riverbanks of the Maniqui river. Puerto Méndez is only a few kilometers away from San Borja, and could be easily reached from town on foot crossing savanna patches, or from the road that linked San Borja with other towns in the Beni. This settlement could also be reached by canoe. On the other hand, Chacal could only be reached by canoe. Between San Borja and Chacal there were several seasonally flooded savannas and oxbow lakes that made the trip on foot difficult, if not impossible. It took one day to get to Chacal from San Borja by canoe. This relative isolation favored the Chimane from Chacal because there were hardly any other people that competed with them for available natural resources. Furthermore, itinerant traders made only occasional stops to exchange products.

Chacal and Puerto Méndez are both located in the multiple use zone on the boundaries of the Reserve. Chacal is located near forest and savanna resources that the Chimane often use. Of special importance to them was the hunting of peccaries. In order to maximize their efforts, the Chimane organized group and overnight hunts to hunt peccaries. Most hunts were carried out travelling by canoe and then walking into the forest or savanna patches where peccaries were attracted by fruiting trees, salt licks, or mud baths. Hunting yields were shared within the extended household cluster, and the surplus meat

was smoked or salted for future consumption. Occasionally, only a small amount of game was exchanged with a neighboring non-Chimane family. Other important animal resources in Chacal were primates, and armadillos taken from the savanna and forest islands. Because hunting was a successful activity in Chacal, fishing was not practiced intensively.

In contrast, the area surrounding Puerto Méndez was composed of secondary forest, agricultural fields, and fallows. There were also oxbow lakes which were important sources of fish and other animal resources. Reportedly, there was a variety of animals near Puerto Méndez before other non-Chimane moved nearby to establish residence. These newcomers subsisted mainly by practicing agriculture, and some subsistence hunting. Thus, it is possible that the low availability of large animals was due to habitat destruction and overhunting. At any rate, the fact is that during the research period there were no large animals hunted with the exception of a few collared peccaries that were hunted when attracted to agricultural fallows. Most of the animals hunted in Puerto Méndez were rodents that are common in secondary growth.

This research has shown that the Chimane from Puerto Méndez have responded to low hunting returns not by moving to other areas where resources may still be plentiful, but by intensifying agricultural activities that cover their dietary needs, and at the same time produce a surplus that permits

them to exchange for market goods. Thus, they are able to obtain jerked beef, and other low quality meat from cattle like offal, feet, and heads that are sold in the regional market. Furthermore, in the face of diminishing returns in hunting, fishing appears to be a more important activity in Puerto Méndez, especially during the dry season. Men, women, and children alike participate in this activity.

The 'sedentary' strategy adopted in Puerto Méndez mirrors the contradiction that many indigenous groups face when becoming more integrated into the market economy. This contradiction points to the fact that people prefer to be self-sufficient but at the same time, are attracted by the commodities and new cultural values that expanding market conditions directly or indirectly impose.

The Chimane so far have been able to reproduce themselves socially by elaborating their subsistence patterns at the level of the extended household cluster. This strategy has been especially clear in the case of Puerto Méndez where agricultural land and faunal resources are limited. At the time of the research there was a kind of division of labor among the households that formed the extended household cluster which was the object of study. Because the unit of consumption was the extended household cluster, some households had specialized in agricultural activities, while other had specialized in acquiring faunal resources. The agricultural surplus permitted the Chimane to acquire firearms

that they lent to successful hunters within the extended household cluster. This resulted in pooling agricultural and faunal resources that everyone could consume.

Chacal and Chaco Brasil had not yet faced land constriction to the extent that Puerto Méndez had. However, the Chimane from these settlements often shared resources, especially game and fish. The extended household cluster in all three settlements was held together by kinship, and reciprocal social ties. In Puerto Méndez, it was key to the group's physical survival.

In terms of levels of well-being measured by the type of housing conditions, health status, and access to services, all three settlements were in an adequate situation. Although there were chronic cases of parasitosis in all three settlements, only in Puerto Méndez were there a few serious cases of tuberculosis. This unhealthy situation indicates the difficulties that the Chimane from Puerto Méndez face: flooding, seasonal hunger, and disease. In 1989, three children died in Puerto Méndez, one in Chaco Brasil, and none in Chacal.

In sum, Chimane productive strategies so far have adequately met their subsistence needs. The case of Puerto Méndez illustrates how the Chimane have found an answer within the market system to low large animal availability; another aspect of this answer is found within the Chimane group itself that has increased social solidarity and reciprocity to make

ends meet. There may be, however, limits to this strategy. Often, market goods are not shared with other members of the extended household cluster. This practice could eventually erode solidarity built on reciprocal labor and sharing of subsistence goods. Additionally, successful agriculturalist Chimane may obtain sums of cash that will contribute to sharpen a division which creates an incipient social stratification such as that found among societies that have undergone social change. These are aspects that need to be further explored.

Chimane Subsistence in the Beni Biosphere Reserve

The question of whether the Chimane in the Reserve are using fishing resources and gathering products sustainably cannot be answered conclusively because of the lack of information on the ecology of the species that are used. Detailed biological research needs to be done on species that are more commonly used.

The use of fish poison has already created conflicts between Chimane and non-Chimane who have been affected by the contaminated water. Fishing with barbasco may have been sustainable under conditions of low population density. Reportedly, however, there are more Chimane practicing this activity, and there are also more non-Chimane people that compete for the same resources that the Chimane use.

Another source of conflict between park rangers and the Chimane has been the gathering of honey. When the Chimane find honey in a tree they usually cut it down. In some areas of the Reserve, this practice has intensified as a response to demand for honey among people from San Borja and other rural areas.

In terms of hunting, this research has shown that there are some species that the Chimane harvest above suggested sustainable harvest rates. These include some species of primates and white-lipped peccaries that are preferred game species not only for food, but also because of their symbolic value in the Chimane cultural system. Because Chimane resource use is flexible it is possible to reconcile Chimane subsistence needs with the need to protect locally endangered species. Reserve officials should work closely with the Chimane to devise management options that could insure the long-term availability of these species. A preliminary step should be to investigate the ecology of endangered species, and establish hunting regimes based on data on reproduction rates, density of animal populations, distribution of the populations in the Reserve and other relevant data that could be useful to regulate hunting.

In addition to hunting regimes to conserve endangered species, it is important to emphasize a type of development which should arise from the Chimane's own initiative. The Chimane will not be willing to change current patterns unless they are offered alternative sources of faunal food. These

sources could arise from developing income-generating projects to obtain cash for meat from the regional market; or from developing domestic animal production systems. The answers have to arise from the Chimane themselves and the administration of the Reserve to determine the feasibility of proposed alternatives to hunting.

There are some lessons to be learned from other indigenous groups. Indigenous groups are able to manage protected areas or their own development as the Kuna and Yanesha experiences illustrate (cf. Breslin and Chapin 1984; Hartshorn et al. 1987). With the support of national and international non-governmental organizations, the Kuna of Panama manage the park where they live. Because their subsistence is based on marine and agricultural activities next to the Pacific shores, the Kuna had little problem using the rain forest as a buffer zone between them and the Panamanian nationals. The Kuna's strong organization and training in management issues have helped them control an area that, although not perfect, is better run than many other protected areas in Latin America.

Indigenous peoples can also take charge of their own development. One example is the income-generating project of the Yanesha Agroforestry Cooperative in Peru. Initially, the area where the Yanesha live, although legally theirs, was going to be the target of a major development and colonization project during Fernando Belaúnde's second government. With the

support of national and international social scientists and indigenous advocates, the Yanesha were able to obtain a redesign of the original project by lobbying with the international lenders. Later, the Yanesha were incorporated in the development project and became involved in the process of harvesting and transforming forest wood following Joseph Tosi's method of strip clearing which incorporates what is scientifically known about gap dynamics. From the beginning, there were many specialists training the Yanesha to run the cooperative. When guerrilla groups forced the specialists to leave, it was thought that the cooperative would end. However, despite the violent political turmoil, the Yanesha have been able to take control of the cooperative, and run it on their own.

The two cases mentioned owed their relative success, in my view, to the following factors. The first is the land rights issue. The people whose land has been declared "protected" should be assured that the land is legally theirs. That is the best incentive they can be given to reconcile with conservationists. Secondly, indigenous peoples' organization, traditional and new, should be strengthened. This is a very slow process but a necessary one to support self-determination and relative economic independence from the outside. Third, convergences and divergences between conservationists and indigenous people should be discussed and resolved realistically. Indigenous peoples redefine their interests as

they become more part of a national society and if they want to adopt ways that may not seem "traditional" in conservationists' eyes, they have the right to do so and to remain on their land. The relative success of the Kuna park and the Yanesha cooperative lies precisely in their organizations' strength and capacity to take control of the park and the cooperative; and that they have legal rights over the land where they live.

Land rights. In the case of the Chimane the land rights issue was legally resolved after the March for Dignity took place in 1990. Following the turmoil produced by the debt for nature swap in Bolivia in 1987, indigenous organizations mobilized to obtain legal rights over the areas that had been given to the logging companies to exploit. It is noteworthy that the argument, from the side of the indigenous organizations, focused on their ability to be better managers of forest resources than the logging companies. The movement was led by the Moxos organization. The Chimane became involved later under the guidance of New Tribes missionaries. They, too, adopted the argument that the Chimane were natural conservationists because they had lived in the forest for hundreds of years causing only minimal impact on the regeneration of natural resources. Víctor Paz's government responded in February 1989, by issuing a decree which stopped all logging activities until the indigenous issue was resolved. A committee was formed to investigate the location

of indigenous groups in the Chimanes forest, and their subsistence patterns. The research was carried out despite the number of conflicts that arose because of the different political agendas of the individuals involved. For instance, one research team would be composed by an indigenous representative, a logging company representative, a social scientist, and an officer from the local government. Finally, the committee produced a thorough report which recommended what areas should be assigned to the indigenous people.

As expected, the areas, or "polygons" alloted to the natives by August 1989, were on the margins of the forest, and did not touch the areas that had originally been alloted to the logging companies for extraction. Thus, the indigenous organizations rejected this proposal.

A year later, and with Jaime Paz as the new Bolivian President, the land rights issue had not been resolved. While the logging companies had accelerated the exploitation of the forest, the indigenous peoples from the area had not been given the land they rightfully claimed. In order to pressure the government to legalize the land claims, the Central de Pueblos Indígenas del Beni organized a march from Trinidad to La Paz (see Jones 1990). This march was the first one of its kind in Bolivia. It lasted one month and the number of marchers grew along the way; 300 natives left from Trinidad but over 700 marchers arrived in La Paz. Reportedly, the Gran Consejo Tsimane' prohibited the Chimane to participate in the

march, and a few who did so despite this command, were expelled from the organization.

Finally, the Bolivian president agreed to deed to the Indians most of the land they were asking for. In the case of the Beni Biosphere Reserve, all the area along the Maniqui river was titled to the Chimane who live along the river. Therefore, the administration of the Reserve recognizes the legal rights of the Chimane to the area.

Indigenous organization. Before 1989, the Chimane had never organized to claim their rights. New Tribes missionaries had helped some Chimane who had land claims, or quarrels with jatata traders in an isolated form. However, due to the pressing need of responding to the number of problems in the Chimanes Forest between indigenous peoples and logging companies, the missionaries saw that it was necessary to help the Chimane mobilize to voice their claims.

The missionaries were successful in gathering nearly 100 Chimane representing settlements located along the Maniqui and its tributaries. The missionaries were able to congregate them through the bilingual schools they coordinate, and through advertisements in the Chimane language aired by the local radio station. Although the legitimacy of the organization may be questioned on the grounds that it functions under the guidance of people who are not Chimane, it is also true that the Gran Consejo Tsimane' (GCT) is currently the only organization through which the Chimane can voice their claims.

Thus far, the GCT has focused on the issue of land rights, and more recently in the marketing of jatata by the Chimane themselves.[1] The GCT is an organization whose aim is to represent the Chimane as a whole. However, it is also important to strengthen local Chimane organizations that have specific goals within a delimited space such as the Beni Biosphere Reserve.

The administration of the Reserve must coordinate with the Chimane and eventually incorporate them into the management of the Reserve. By strengthening a Chimane socio-political organization within the Reserve, the Chimane can have a solid foundation from which they can face and negotiate issues that affect the access and control of the natural resources that they use for their subsistence.

The Chimane as conservationists. My work shows that there are culturally prescribed types of behavior that one can label as "conservationist", such as the reluctance to cut down trees that have mythological "owners". Nonetheless, it is more realistic to affirm that the Chimane face diverse situations which compel them to use resources in ways that are not considered conservationist behavior by westerners.

In an expanding market system, some trade-offs are inevitable. It follows that policies must be formulated in

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[1] The jatata marketing project was written by Richard Piland (1990), based on data obtained by A. Chicchón and R. Piland in 1989. Funds were provided by Conservation International.

light of the interplay of cultural factors and the socio-economic opportunities and constraints that condition the manner in which the Chimane extract a livelihood from their environment. New ways have to be found to encourage the Chimane to manage resources more carefully in the interest of conservation but, esentially, for their own future well-being.

Policy must be based on facts about resource use and not on impressionistic evidence manipulated to benefit interest groups. The myth of considering the Chimane a priori conservationists will not help them to take responsible control of the environment that they use. In this world-system there are hardly any other frontiers that have not been touched. At an accelerated pace, we are not only facing the loss of biodiversity, but also the loss of cultural diversity. Younger generations of indigenous societies are increasingly losing the ecological knowledge that their elders had.

Anthropologists, influenced by evolutionist theoretical frameworks have often fallen in the trap of considering contemporaneous indigenous peoples as the "pristine primitive". In Eric Wolf's words:

> ...it has been rightly said that anthropology is an offspring of imperialism. Without imperialism there would be no anthropologists, but there would also be no Dené, Baluba, or Malay fishermen to be studied. The tacit anthropological supposition that people like these are people without history amount to the erasure of 500 years of confrontation, killing, resurrection, and accomodation. (Wolf 1982: 18)

This dissertation has offered some answers to resource use and market involvement among the Chimane of the Beni Biosphere Reserve, but as with many other research endeavors new answers open new questions that demand to be explored. In this sense, this work does not mark the end, but only the beginning of our understanding of the way the Chimane use natural resources and the process of their integration into the world-system.

APPENDIX A

LIST OF GAME OF
THE BENI BIOSPHERE RESERVE[1]

SCIENTIFIC NAME	ENGLISH	SPANISH[2]	CHIMANE[3]
PRIMATES			
Alouatta sp.	howler monkey	manechi	uru'
Aotus sp.	night monkey	mono cuatro ojos	isbara'
Ateles paniscus	spider monkey	marimono	odo'
Callicebus torquatus	titi monkey	mono titi	mo'jo
Cebus sp.	cebus monkey	mono silbador	oyoj
Saimiri boliviensis	squirrel monkey	chichilo	chichi'
RODENTIA			
Agouti paca	paca	jochi pintado	shätij
Dasyprocta sp.	agouti	jochi colorado	naca'
Hydrochaeris hydrochaeris	capybara	capigüara	óto'
Sciurus sp.	squirrel	ardilla	bäcäj
EDENDATA			
Tamandua tetradactyla	tamandua anteater	oso hormiga	o'oyo
Myrmecophaga tridactyla	giant anteater	oso bandera	yúshi'
Dasypus novemcinctus	long-nosed armadillo	tatú	väsh
Priodontes maximus	giant armadillo	pejiche	shajbe
Bradypus sp.	three-toed sloth	perico	úrubej
PERISSODACTYLA			
Tapirus terrestris	tapir	anta	shí
ARTIODACTYLA			
Tayassu tajacu	collared peccary	taitetú	quiti' varej
T. pecari	white-lipped peccary	chancho de tropa	mumujñi
Mazama americana	red brocket deer	urina	ñej
M. gouazoubira	gray brocket	huaso	ñej
Blastoceros dichotomus	marsh deer	ciervo	báchona

CARNIVORA			
Nasua nasua	coati	tejón	chu'
Potos flavus	kinkajou	mono michi	voyo'
Lutra longicaudis	otter	lobito de río	ujtyusu'
Pteronura brasiliensis	giant otter	londra	uveveruj
MARSUPIALIA			
Didelphis marsupialia	opossum	carachupa	varishi'
REPTILE			
Geochelone carbonaria	tortoise	peta de monte	quijbo
Podocnemis expansa	arrau sideneck	peta de río	meme'
Melanosuchus niger[4]	black caiman	cocodrilo	mijmama
Caiman yacare[5]	caiman	lagarto	coshifore

1. Elaborated from Stearman and Redford (1987) and own field notes.

2. In regional Bolivian Spanish.

3. Following spelling by Gill (n.d.).

4. Only eggs eaten.

5. Eggs and tails eaten.

APPENDIX B

LIST OF SOME FISH CAUGHT BY
THE CHIMANE AT THE BENI BIOSPHERE RESERVE[1]

SCIENTIFIC NAME	SPANISH	CHIMANE
ELASMOBRANCHIOMORPHI		
POTAMOTRYGONIDAE (family)		
Potamotrygon spp (3)	raya	pi'pidye' isinu' bu'maty
CYPRINIMORPHI - CHARACOIDEI		
ANOSTOMIDAE		
Leporinus trifasciatus	boga	tomsis
Rhytiodus sp.	pintagruesa	boyatdye'
Schizodon fasciatum	pacuzillo	tobiri
CHARACIDAE		
BRYCONINAE (subfamily)		
Brycon cf. cephalus	jatuarana	jo'sa
Salminus maxillosus	dorado	cajsare'
Triportheus sp.	sardina	siyasiya
CHARACINAE		
Acestrorhynchus sp.		viroro'
Charax gibbosus		shiare'
Roeboides sp.		shiare'
RHAPHIODONTINAE		
Raphiodon vulpinus	cachorro	nabatdye
TETRAGONOPTERINAE		
Markiana nigripinnis	sardina	cum
other Tetra		cum
CURIMATIDAE		
Curimata sp.	sabalina	bojmo'
Eigenmannina melanopogon		doradyet
Prochilodus nigricans	sábalo	vonej
ERYTHRINIDAE		
Hoplerytrinus unitaeniatus	yayú	pu'na
Hoplias malabaricus	ventón	sheresherej

SERRASALMIDAE		
Colossoma macropomum	pacú	chäe
Serrasalmus cf. nattereri	palometa	copinaty
Serrasalmus sp.	piraña	irimo'
CYPRINIMORPHI - GYMNOTOIDEI		
GYMNOTIDAE		
Gymnotus sp.	anguila	enono'
SILURIMORPHI		
AGENEIOSIDAE		
Ageneiosus sp.	boca ancho	saca'vadye'
CALLICHTHYIDAE		
Hoplosternum littorale	buchere	sisij
Hoplosternum thoracatum	simbadito	tsitsi
DORADIDAE		
Megalodoras irwini	tachaca	távara
Pterodoras granulosus	tachaca	vutuchi
HYPOPHTHALMIDAE		
Hypophthalmus sp.		amere
LORICARIIDAE - HYPOSTOMINAE		
Pterygoplychthys multiradatus	zapato	vátse
Pterygoplychthys sp.		co'ro'
LORICARIIDAE - LORICARIINAE		
Loricariichthys cf. maculatus		shimimij
PIMELODIDAE		
Hemisorubim platyrhynchos		shicurity
Leiarius marmoratus	bagre pintado	shivajnarety
Leiarius sp.	toro	cavadye'
Phractocephalus hemiliopterus	general	ivijnadye'
Pimelodella sp.	bagre	jutiru
Pimelodina flavipinnis	blanquillo	pincushi
Pimelodus sp.	bagre	jutiru
Pseudoplatystoma fasciatum	surubí	sona'are'
Pseudoplatystoma tigrinum	chuncuina	itsiquidye'
Sorubimichthys planiceps	paleta	paquisdye'
PERCIMORPHI		
CICHLIDAE		
Astronotus ocellatus	palometa real	tserepapa
Cichla ocellaris	tucunaré	saamapi

SCIAENIDAE		
Plagioscion squamosissimus	corvina	chavapa
unidentified		ishij pasha' cotyij taquedye

1. This list was elaborated with Chimane informants who were shown technical drawings from Lauzanne and Loubens (1985). Many species identifications were confirmed with slides and the assistance of João Paulo Viana.

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Avecita Chicchón was born on April 7, 1960 in Lima, Peru. She completed her elementary and secondary school studies at Colegio Santa María in Magdalena del Mar, Lima. She studied at Pontificia Universidad Católica del Perú in Lima where she obtained a B.A. in social sciences with a major in anthropology. In 1986 she obtained a M.A. in anthropology from the University of Cincinnati. She began doctoral studies in anthropology at University of Florida in the fall of 1986. At Florida, she focused her studies on social and ecological aspects of rural people relating to their environment.

Her ethnological fieldwork experience includes studies among the Campa-Ashaninka of Satipo, Campa-Nomatsiguenga and peasants of Pangoa, and Aguaruna of Alto Mayo in Peru. From September 1988 to December 1989, she carried out her dissertation research among the Chimane of the Beni, Bolivia.

She is married to A. Richard Piland III and has one child, Natalia Casandra.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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This dissertation was submitted to the Graduate Faculty of the Department of Anthropology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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